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An Address

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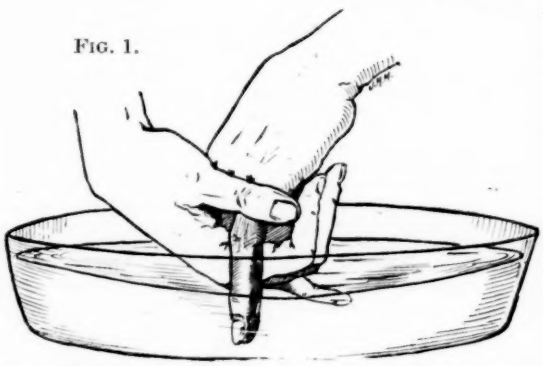
LECTURER IN PRACTICAL SURGERY, UNIVERSITY OF LIVERPOOL; HON. ASSISTANT SURGEON, LIVERPOOL ROYAL INFIRMARY.

The hangnail, the thorn-pricked hand of the gardener, the needle-prick of the seamstress or surgeon, and the bites of the gnat, lesions too trivial to figure in examination papers, are too often a nightmare in our practices. It is no exaggeration to say that in any large city many valuable fingers are amputated for gangrene which have never been infected. These and others permanently crippled might have been saved by a better appreciation of the usual reaction to injury and a knowledge of the destructive action of antiseptics, hot fomentations, and squeezing in search of non-existent pus.

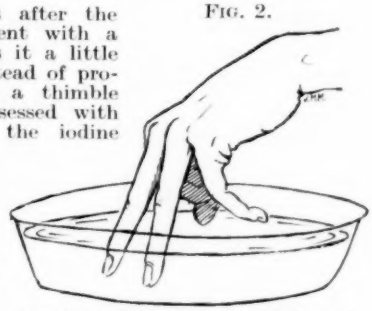
FIG. 1.



The usual method of soaking a finger, the nail-bed tenderness of the opposite little finger is diagnostic.

I am not concerned with the infected finger but with its antecedents—the reaction to injury. It is rare for a serious infection to supervene upon the pricked finger of the gardener or in the poor child with a hospital dressing trailing in the mud as he hobbles home with a cut foot. In conformity with modern first-aid knowledge both will have had the wound washed. Experience will show that wounds kept dry suppurate less frequently than those kept moist, so a liberal application of any mild spirit preparation, such as tincture of iodine, may complete the treatment. Some quickly forget their injuries, but doctors, nurses, and the more educated lay people are all too ready to imagine that the thorn or needle has carried germs into the depths, so a vigorous squeeze initiates treatment, to make the part bleed and wash back the organisms. A moment's thought would show that it would be just as sensible to try to squeeze water out of wet socks without first removing the boots. This treatment can only disseminate the organisms beneath the skin, and, by further injuring the tissues, provide a nidus of extravasated blood wherein bacteria may multiply in security from the surrounding lymph and its protective qualities. *Squeezing for pus*, once started, becomes a hobby of patient and practitioner whenever they look at the finger. It is quite easy to recognise such maltreatment in a progressively tender finger: (1) by the circular line of demarcation between the healthy and the congested area; and (2) by the almond-shaped patch of congestion where pinching has been the continuing trauma. I have seen boils on the more accessible parts of the body so strenuously pinched that a black patch of gangrene the size of a sixpence had appeared; if to this a really hot fomentation is added a crop of vesicles will form and so simulate anthrax as closely as vaccinia. In a museum of public health a few years ago there figured a coloured illustration labelled "Anthrax, organisms not found." I wonder how many boils are so treated.

FIG. 2.



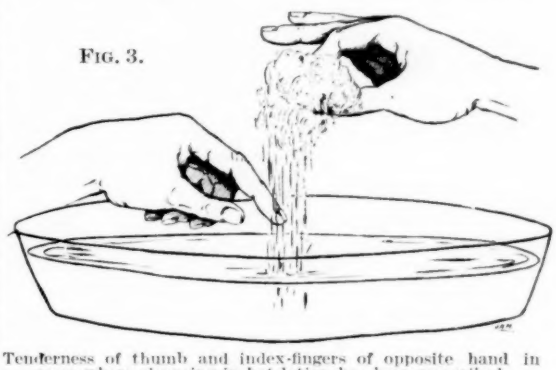
Simultaneous soaking of middle and ring fingers in an injury to either.

Twelve hours after the injury the patient with a sore finger finds it a little tender, and instead of protecting it with a thimble he becomes obsessed with the idea that the iodine was not strong enough, so into carbolic, lysol, or whatever antiseptic is being boomed by the chemist or the press that unfortunate finger is plunged, all oblivious of the truth that organisms cannot be killed on the body without necrosis of the underlying soft tissues. The analgesic action of the carbolic compounds on the fingers gives a false sense of security to the patient and an anxious time to the doctor, whose danger-sign of throbbing pain is masked. If all goes well the patient will escape with prolongation of finger-tenderness for three weeks or more beyond the normal healing-time. Unfortunately, about the third day the analgesic effect lifts slightly, so more lysol or a hot fomentation is applied, with gangrene as an end-result.

Thinking that unless an antiseptic stung on application it could do no good, an ex-officer managed to convert the punctate sting of a gnat into an ulcer three inches long and half an inch wide. I trust the consultation restored his faith in the profession and also that another time one of my colleagues will think of lysol before diagnosing gumma.

It is astonishing how experience differs. Some have never seen any harm done by the carbolic series, whereas I have seen three fingers and an arm amputated for it. Naturally, therefore, I suspect it in all indolent wounds where necrosis and not pus-formation is the outstanding feature. The atrophic taper finger of the less severe case, once seen, is not likely to be forgotten.

FIG. 3.



Tenderness of thumb and index-fingers of opposite hand in cases where cleansing in hot lotion has been prescribed.

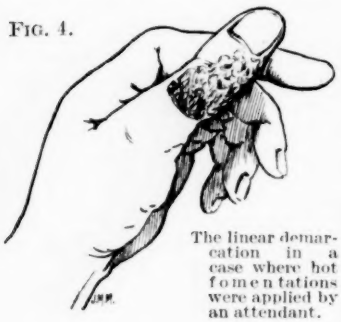
FOMENTATIONS.

It is not, however, to the mechanical irritation of pinch, squeeze, or grip, nor to the chemical irritation of lysol that the prize must be given for the production of the greatest physical pain and misery, but to the *hot fomentation*. The advice to go home and soak a

finger in hot water is criminal. The public interpret this into "the hotter the better," and literally scald their fingers to death. Nor do the shrieks from a casualty department at re-dressing time reveal any advance in the battle against pain.

When lecturing on practical surgery Prof. R. E. Kelly used to point out that a hot fomentation or a cold compress would keep its initial temperature for only two or three minutes after its application and then become, for the remaining two or four hours, a moist dressing at body temperature. What value can two or three minutes' intense heat or cold be to any wound?

FIG. 4.



The linear demarcation in a case where hot fomentations were applied by an attendant.

As a student I could not understand why Mr. T. H. Bickerton used ice-water compresses in eye cases. His wisdom may be contrasted with events in another city, where it is customary to foment. The night after a preliminary iridectomy a nurse came to a patient's bedside with a saucepan full of boiling water and cotton-wool dabs which she had just removed from the kitchen fire. Quickly, for they were all too hot for her fingers, she dropped one on the eye of her drowsy patient. That eye was lost and a man was doomed to blindness lest the other eye should exhibit the same peculiar tendency to inflammation.

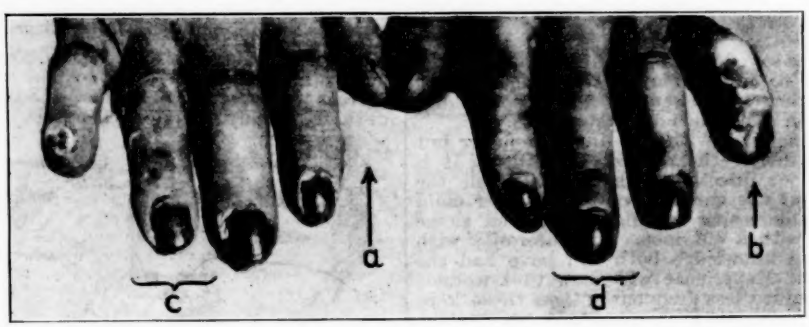
Fingers scalded by hot water are easily recognised, the story is so constant; a little tenderness followed a prick, so the patient, fearing the possibility of infection, began to soak it in hot water. About the fourth day it is presented to the doctor for the first time. Not having been kept dry, its resistance to infection has been lowered by waterlogging, but rarely is infection present, so great has been the heat. The finger is tender; slightly swollen, and blue from congestion; the site of injury is free from pus and has probably been enlarged by amateur needling. A small incision is made but no pus is obtained, and so fomentations are continued. A few days later the finger is causing anxiety and is the subject of a consultation. At the site of injury a small slough has formed and a little serum is being discharged. The bluish discoloration ends abruptly half way along the proximal phalanx—the line of grip. Into this congested area the medical attendant feels too often convinced that either he or his surgical friend should make a further incision and discover the missing pus. The incision will reveal a deep fascia tinged a beautiful light green from the extravasation of blood pigment, comparable to the discoloration seen on the back of the uterus in pelvic hæmatocele. So long as the tissues are glistening this fascia will recover, often without slough formation. The incision has been a useless one and heals by first intention. If the fascia has lost its glistening appearance the incision will be a useful exit for sloughs. Occasionally the incision will evacuate a few drops of material resembling the "anchovy sauce" of liver abscess. The site at which this pus occurs is usually the line of demarcation, several inches away from the original prick, and not in the centre of the diseased area. The final picture is one of aseptic or dry gangrene due to moist heat; an amputation follows and healing by first intention is the rule—an impossibility if the gangrene were of infective origin.

FIG. 6.

Gangrene of little and ring fingers due to Raynaud's disease, no nail-bed tenderness or ulceration, and a dry hand not moist as in hot-water gangrene.

Proof of the deadly nature of boiling water can be obtained by considering for a few moments the delicate art of cooking a finger and its effect on other fingers. With the exception of the ring finger, it is possible to plunge each finger separately into a bowl of boiling water, but few are brave enough to do this without gripping the finger with the opposite hand, hence the line of demarcation and site of abscess already referred to. An examination of the opposite hand will reveal tenderness of the nail-bed of the little finger, even ulceration (Fig. 1). In the case of the ring finger it is the middle finger of the same hand that is likely to share the scalding (Fig. 2). If the prescription has been to cleanse the sore with cotton-wool whilst soaking, then the thumb and index-finger of the opposite hand should be examined (Fig. 3). In those fortunate enough to have a nurse, wife, or sister to apply the fomentation, the lesion will often be a patch on the pricked side strictly limited below by the grip of the patient as he steels himself for the two-hourly onslaught (Fig. 4). Naturally it is useless to look for a nail-bed tenderness in this patient, but it will turn up quite unexpectedly in the nurse. I shall never forget one case in which family relations appeared distinctly strained on my arrival and were made worse by my inquiry as to pain, which the patient forcibly assured me that I should feel if I had a wife and doctor squeezing the sore every few hours looking for pus. Fortunately, an incision appeared necessary, and this, he was assured, would obviate the necessity for further squeezing. I felt certain that this finger had also been vigorously

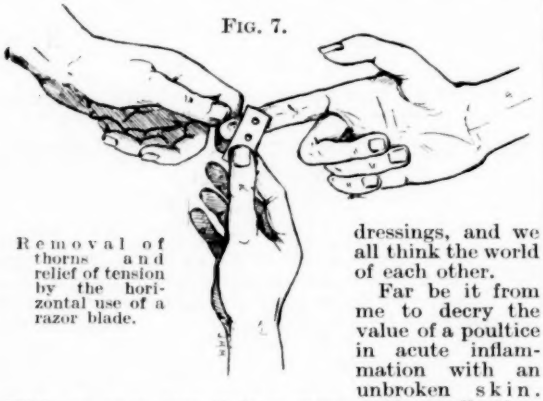
FIG. 5.



The fingers of a man after ten months' soaking in hot water: (A) the thumb, the original site of injury, healthy; also opposite thumb; (B) the little finger of the opposite hand which was next involved and is here seen passing into a stage resembling the atrophic finger of carbolic; (C) the fingers of the original side then became ulcerated; and finally, (D) the remaining fingers of the opposite hand. Healed on dry dressings in 14 days.

scalded, but it was too risky to ask. Imagine my joy, as we cleaned the instruments, when the wife apologised for being unable to pick them out of the hot water as her fingers were so tender with applying hot fomentations to her husband day and night for the last ten days! The finger healed on cold, moist

FIG. 7.



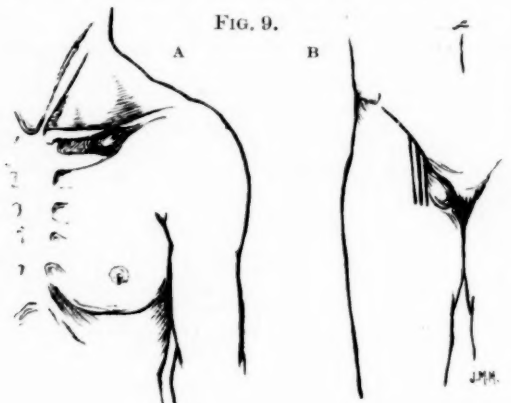
Removal of thorns and relief of tension by the horizontal use of a razor blade.

dressings, and we all think the world of each other.

Far be it from me to decry the value of a poultice in acute inflammation with an unbroken skin. With an open sore it is a very septic application, especially if not renewed each time. Such applications die hard and only recently a friend observed a breast tinged green by natural herbs obtained from the milkman—the cow-dung poultice—for a mammary abscess in 1927.

The last finger I amputated had been poulticed with linseed. Never shall I forget the cloud of steam, as from a Christmas pudding, that greeted me as I exposed the hand, which was swollen enormously from the wrist downwards. Complete loss of the hand appeared imminent—all from a pricked finger that had never suppurated. I waited 24 hours, then amputated the gangrenous finger; the handle-of-the-racquet incision evacuated half a drachm of necrotic pus from the dorsum—a finger-grip abscess—and the

FIG. 9.



(A) The apical gland of the axilla; this site should always be examined, because it is this gland which most frequently suppurates and produces axillary cellulitis. (B) Cloquet's gland, of similar importance to the apical gland of the axilla.

deep fascia was light green in colour. Could the hand be saved? In spite of the so-called pus, that stump healed by first intention; the green dorsal fascia did not slough except just below the styloid process of the ulna, the point of maximum pressure when the finger-grip was changed to a wrist-grip as the size of the poultice was increased. It healed quickly on incision.

Ten months ago a stone-mason developed an abrasion of the pulp of the left thumb, since when nearly every nail has been involved and Raynaud's disease suspected. The moisture of the hand first attracted our attention, for surely a Raynaud's hand would be dry. Then we examined the thumb; it had healed without loss of tissue—also rare in Raynaud. Then came the following story to delight the heart of Sherlock Holmes. For months he had been soaking his fingers in hot water; after the left thumb the little finger of the opposite hand became "septic," then all the finger-nails of the original hand, finally those of the opposite hand; meanwhile the thumb had healed, and with its fellow of the opposite side it remained healthy, being well out of the way of subsequent scaldings. Four days on dry dressings removed all pain. He left hospital in ten days, healed. Note how clearly the little finger of his left hand resembles the atrophic taper-finger of the carbolic days (Fig. 5). Contrast Fig. 6, gangrene due to Raynaud's disease, in hospital at same time.

ETHYL CHLORIDE.

A story against myself will suffice. The patient was a doctor; a boil on the back of his finger had commenced to throb, and the hour was late, so we dispensed with an anæsthetist and used ethyl chloride as a local freezing mixture. I opened an infected follicle 5 mm. in diameter, expecting it to separate in three days and heal in a week. It did not heal until a slough three-quarters of an inch long had been extracted by the doctor three weeks later. A slough so big was surely due to the action of ethyl chloride on congested tissue.

THE TREATMENT OF A SORE FINGER.

Keep it dry. Protect it from squeezing by a thimble or celluloidguard. If a thorn is still in do not squeeze. Take a safety razor blade and slice off the over-lying epithelium; this will drag the thorn out and, should the spot suppurate, the denuded area will provide an easy exit for pus and so limit inward spread (Fig. 7). If the finger is throbbing relieve the tension by an incision and then apply moist dressings at body temperature. It is not easy to place these small incisions with accuracy and to avoid the annoyance of seeing the abscess burst two or three days later 1 mm. from the line of incision. Use of the razor blade in a horizontal direction will show up the site of puncture and greatly assist in correctly placing the incision (Fig. 8).

FIG. 8.

Illustrates the ease with which a small septic focus may be incised after removing the superficial epithelium.

FIG. 10.

The cotton-wool pack beneath the centre of the nail and not its narrow edge, of value in cases of ingrowing toe-nail.

For accurate localisation of an abscess the method adopted by Mr. Frank Jeans is well worth remembering. In kindly thought for his patient he does not brandish a probe, but takes the more homely match. If the centre of the brawny swelling shows a maximal point of tenderness a small collection of pus may be expected; if two maxima are encountered then a larger collection may be expected and the incision must be made between these points. For lines of incision that masterpiece by Kanavel on "Infections of the Hand" should be followed. I owe an early introduction to this book to the late Prof. Thelwall Thomas, whose masterly mind was quick to realise the importance of the work and to distribute it amongst his residents and dressers long before it appeared in the articles and text-books of this country.

Avoid dipping with a pointed knife; the so-called "breast knife" is a safer instrument. Amongst injuries inadvertently produced I recollect a stiff metacarpo-phalangeal joint damaged by an incision in a fruitless search for pus after a stork-bite an inch away. For infected fingers use a general anæsthetic and a tourniquet. Watch lymphangitis; it often subsides without suppuration, and if the lines are broken between the site of injury and the gland, let well alone. Further exploration of the wound, unless there is definite evidence of pus under tension, may turn the scale against the patient. The danger zone is now in the glands.

The epicondylar gland drains the lymph from the little finger and half the ring finger, passing it on with that from the rest of the hand to the axilla. All the axillary glands may be enlarged, but the one most liable to suppurate is the apical gland, because it is liable to be nipped between the clavicle and the first rib (Fig. 9 (A)). A sling should therefore be worn in all cases, and the clinical examination for glands should be completed by gently pressing beneath the middle of the clavicle. In the lower extremity the long axis of the inguinal glands points to the perineum; an unsuspected carcinoma of the rectum may be revealed by this. The femoral glands are much lower in the limb and their long axis points to the toes, but they all enter the iliac glands through the crural canal, and therefore the gland of Cloquet assumes the same importance in infections as the apical gland of the axilla (Fig. 9 (B)). If the glands are enlarged the patient often experiences on the third or fourth day a rigor, rise of temperature, and profuse sweating, as the toxins or organisms previously held up in the gland are poured into the blood stream. This may herald a fatal septicæmia, but fortunately nothing more than a mild rheumatism usually follows. In boils it is often called influenza and figures frequently, together with so-called pleurisy, in the history of perirenal abscess. Do not discard the sling or permit walking until all gland tenderness has disappeared for at least four days, and it is well to remember that the wound is often healed before the glands give trouble, especially in staphylococcal infections.

Greater use should be made of metal cock-up finger splints, discarding these the moment it is realised that the infection is subsiding and that it is wise slightly to prolong healing in order to avoid the stiffening of joints passively involved in inflammatory reaction.

Mechanical Irritation of Nail Growth as a Sequel of Sore Fingers and Toes.

I have seen a typist in danger of losing her employment because the nail had been allowed to grow too soon. On cutting it back she was able to work with comfort and had no further pain because, when the nail reached the tender spot again, good scar tissue had formed.

Whilst on holiday in the South of England I was asked to see a cook who had been tormented for over a year with a sore finger. Twice the nail had been removed and total destruction of the nail-bed had even been proposed. She did not like this suggestion, and, tired of the profession, she kept at home, dutifully cleansing the sore in hot water, with the result that the thumb and index finger of the opposite hand had begun to crack. I recognised that an ingrowing finger-nail was the painful factor, and advised pushing a piece of cotton-wool under the body of the nail in order to lift the pressure off the tender spot. She was cured in three weeks.

For ingrowing toe-nail this cotton-wool pack under the centre of the nail and not under its narrow edge will quickly bring relief, and subsequent square trimming of the nail will prevent recurrence (Fig. 10).

In conclusion, I cannot resist emphasising the damage that is being done by boiling water. Recently I saw a woman with a sloughing carcinoma mammæ, mistaken by her for an abscess. As it was in an awkward situation to foment or soak she had filled the modern wide-necked milk bottle with boiling water and inverted this on her nipple. I have also seen a man with a flexion deformity of the middle finger, the end-result of a knife-cut 20 years ago, which took four months to heal and, as he announced with pride, two men to hold it in the boiling water. Abolish boiling water and with it phlegmon.

TONSILLECTOMY IN CHRONIC ARTHRITIS.

A REPORT OF TWO HUNDRED CASES CARRIED OUT AT THE ROYAL BATH HOSPITAL, HARROGATE.

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The investigation which forms the basis of this report has been made on the assumption that the tonsil acts as a focus of infection in certain cases of chronic arthritis. This has been abundantly proved by clinical experience and will not be further discussed.

The observations which follow were undertaken as an attempt to find some means of detecting clinically the focally active tonsil, and to discover the type of case most likely to be benefited by its removal. Until these two factors can be fairly accurately determined tonsillectomy for systemic disease must border on the empirical, will be adopted in unsuitable cases, and will prove a source of disappointment.

The 200 cases of tonsillectomy here reviewed have been taken serially, without selection, over a period of six years. I have purposely not included cases done elsewhere, in order to obtain the greatest uniformity in points of diet, technique, and after-treatment. In each of these 200 cases a record was kept of the name, age, sex, systemic condition and its duration, throat history, size and colour of tonsils, crypt contents, condition of the cervical glands, and bacteriological findings. In addition results have been obtained this year in 172 cases.

Sex .. 67·5 per cent. females .. 32·5 per cent. males.
Age .. Total average 30 .. Extremes 10 to 64.

Table I.

—	Systemic condition.	Total.	Percentage of occurrence.	
			In whole series.	In males.
1	Subacute rheumatism group ..	54	27	33
2	Infective arthritis C	90	45	43
3	" " D	28	14	5
4	Fibrositis	19	9·5	8
5	Osteo-arthritis	1	0·5	0
6	Neuritis and sciatica	8	4	11

The nomenclature adopted is that originally devised and used by the three mineral water hospitals (Bath, Buxton, and Harrogate).

Group 1 includes subacute cases of, recurrences of, and convalescents from rheumatic fever or "acute rheumatism."

Groups 2 and 3.—"Focal infective arthritis": C indicates that the focus has been located; D that its situation is unknown.

Clinically these cases are of the following type: Onset, at the age of 25 to 40, sometimes acute, often febrile; usually bilaterally symmetrical; at first periarticular; early limitation of movement; smaller joints first affected; fusiform swelling of joints. This category therefore includes many cases of "rheumatoid arthritis" and Still's disease.

The figures are based on the final diagnoses made by the physicians on the patients' discharge. The third column of figures is included to show that sex is not an important influence. The preponderance

of females in "infective D" is due to the inclusion of cases of indeterminate chronic arthritis of atrophic type, the classical "rheumatoid arthritis," which is recognised as affecting women particularly.

Duration.—Several of the subacute rheumatism group were recurrences of an original attack many years before. In such cases the duration given is that of the present attack, and does not include long periods of freedom from arthritis.

Under one year	102 cases.
One to five years	55 ,,
Over five years	43 ,,

I hoped that from a large series such as this some definite clinical picture characteristic of the focal tonsil would emerge. I therefore paid particular attention to five points:—

1. Tonsil history—
   + + = "Related."
   + = Positive.
   0 = Negative.
2. Tonsil colour.
3. ,, size.
4. ,, crypts.
5. Cervical glands.

These five points I regard as the five "landmarks" to be kept in mind when assessing the focal activity of a tonsil, and it was these that guided me in selecting for operation these 200 cases out of over 400 referred to me by the physicians.

History.—Three types were noted:—

1. "Related" (+ +): cases in which attacks of tonsillitis bore a definite relation to the onset or exacerbations of the arthritis.
2. Positive (+): i.e., repeated sore-throats, previous attacks of tonsillitis or quinsy, but unrelated to the arthritis.
3. Negative: "Never any trouble with the throat." With allowances for defective memory and the extremely non-committal attitude, these histories are probably fairly reliable.

Colour.—Redness localised to the tonsil is definite evidence of tonsil infection; general redness of the fauces is usually due to dental sepsis, alcohol, or tobacco; but may mask a tonsillitis. Twenty cases in which the colour was normal showed nothing characteristic in their bacteriology.

Size.—This has been agreed by all observers to be no index of infectivity. I have been unable to find any variations other than could be accounted for by the normal physiological shrinkage with age.

In 30 patients tonsil operations had already been done, in most of them many years previously, and fairly large remains—in some cases apparently intact tonsils—were present. I have always regarded such "remains" with suspicion. The scarred surface may be pale, but the crypts are often full of infective material pent up by the cicatrised crypt mouths. I can find no evidence, however, that they are a greater potential focus than intact tonsils. Their infectivity, however, is more latent, and I should be inclined to advise complete removal of such tonsils in a case of infective arthritis, even though every other point were negative—which is rare.

Crypts.—These are revealed by pus or bleeding on pressure on the tonsil.

Glands.—The key-gland of the tonsil is situated just behind and below the angle of the jaw. Enlargement of these glands can be regarded as definite evidence of tonsil infection, present *or past*.

Tenderness.—This is very rarely met with, even in cases of gross chronic infection. Usually it is only found during or just after acute tonsillitis. It was noted in five cases only.

Associated Infection.—Many cases were edentulous. Some had had extensive extractions some time before with partial improvement of the arthritis. I have made it a rule not to touch the tonsils until dental sepsis has been dealt with. The same applies to purulent nasal or sinus infection.

Bacteriology.—In each case the excised tonsils have been scorched to destroy any surface contamination, cut open, and cultures made from the interior.

Results.—A questionaire was sent out to all patients on Jan. 1st, 1928. The patients were asked to state if the arthritis was cured, improved, unchanged, or worse; 172 replies were received, as follows:—

Cured ..	35	134	78 per cent. good results.
Improved ..	99		
Unchanged ..	21	38	
Worse ..	17		

The ratio of good results to bad results is thus 134 : 38. This ratio I have expressed, for comparison purposes, and shall refer to, as the "result percentage"—in this case 78 per cent. These results were reported from three months to six years after the operation. Within these limits the cure or improvement is no transitory affair. The results for infective arthritis in the first three years vary by only 5 per cent. from those in the last three years.

Cross-checking the Figures.

In the search for some "formula" for the focal tonsil each of the five points above mentioned has been taken and cross-checked against the others and compared with the bacteriological findings and the results. Most of these calculations led up "blind alleys" and are too inconclusive to produce.

In the case of *history*, the figures are as shown in Table II.:—

TABLE II.

—	All cases.	—	Subac. rhm. group.	Infec. C. group.
		Per cent.		
Related (+ +) ..	63	31·5	54	26
Positive (+) ..	75	37·5	20	38
Negative (0) ..	62	31·0	26	36

I have been unable to discover any relation between the history of tonsils and their size, the condition of the crypts, or enlargement of glands. The bacterial findings showed that *Streptococcus hæmolyticus* occurred in much greater proportion in the positive than in the related cases. The figures in the two right-hand columns support the recognised clinical fact that acute rheumatism is often preceded or accompanied by tonsillitis. Table III. shows the connexion between a related history and systemic disease from another angle.

TABLE III.

Systemic infection.	All cases.	Related history cases.
	Per cent.	
Subacute rheumatism ..	27	46
Infective C	45	36·5
,, D	14	8
Fibrositis	9·5	9·5

Table III. shows that a related history is commonest in the subacute rheumatism group. Table IV. shows—what does not necessarily follow—that this form of arthritis is commonest among the related history cases.

TABLE IV.—"*Result Percentages*"

Of whole series = 78 per cent. cured and improved.

—	History related.	History negative.
	Per cent.	
In all cases	91	64
In subacute rheumatism group ..	55	50
In infective C group	96	51

It will be seen that the related history cases show a high percentage (91) of good results. The results in the subacute rheumatism group as a whole are also good (93). I concluded at first that the 91 per cent. was due to the relatively large number of subacute

rheumatism cases with a related history. The above figures show that this is not so, the subacute rheumatism percentage being only 55 as against 96 for "infective C." The high percentage of good results in cases with a related history is therefore due to two factors—the larger number of cases of subacute rheumatism with 55 per cent., and a smaller number of cases of "infective C" with 96 per cent. This is an example of the ease with which figures can lead one astray. They show, which was not at first evident, that a related history in a case of infective (focal) arthritis is a particularly favourable point in prognosis when considering tonsillectomy; whereas in subacute rheumatism it is more often met with but does not mean quite so much.

Crypt Contents.—Pus and debris were noted in 156 cases; bleeding only, without pus, in 16. Of the 44 cases in which no pus was found on pressure, 27 cases showed pus in dilated crypts on section. The remaining 17 were fibrous tonsils containing a small amount of serous fluid only and were not heavily infected. These tonsils probably had no bearing on the case, were not really infected, and should not have been removed. In considering a tonsil pressure on which produces neither pus nor bleeding, the other points against it should be very definite before tonsillectomy is advised.

Enlarged Glands.—Table V. shows the incidence of palpably enlarged tonsillar lymphatic glands.

TABLE V.—*Glands.*

Type of case in which glands were enlarged.	Per cent.	Type of case in which glands were enlarged.	Per cent.
All cases	57·5	Related (+ +) history	61·0
Large tonsils	60·0	Negative history	58·0
Medium ,,	60·0	*S. hæmolyticus* infection	55·0
Small ,,	54·0	Subacute rheum. group	54·0
Tonsillar "remains"	60·0	Infective C group	60·0

It will be seen that these figures show very little variation. They afford an instance of the "blind alleys" referred to earlier and show that, although enlargement of these glands points to tonsillar infection, it is no indication of focal activity. It must be remembered that they may remain enlarged after a tonsil infection has subsided.

Table VI. shows the bacteriological findings. A streptococcus was isolated in 197 out of 200 cases—i.e., 98·5 per cent.

TABLE VI.—*Bacteriological Findings.*

Organism.	—	In pure culture.
	Per cent.	
Streptococcus hæmolyticus (pyogenes)	36·5	8
,, *viridans (salivarius)*	92·5	29
,, *non-hæmolyticus*	49·0	5
S. mucosus capsulatus	4·5	—
Micrococcus catarrhalis	2·5	—
Bacillus pfeifferi	1·0	—
Pneumococcus	0·5	—

There were only three non-streptococcal cases; two of them yielded *Staphylococcus albus* only and belonged to the infective arthritis D group. The third, a subacute rheumatism, gave *S. albus* and *aureus*.

In only one case, and then only on one side, was a sterile tonsil found.

The Part Played by Streptococcus viridans.

For comparison and control purposes 100 tonsils, removed from children of under 10 years, have been examined by the same technique. These tonsils were of the hypertrophied type and were selected as the nearest obtainable to the normal tonsil. Table VII. shows the bacteriology of these. A streptococcus was isolated in 72 per cent.

I think it is very curious that the pneumococcus was only found in one of my rheumatic cases, in view of its frequency in nasal infection. It suggests the possibility of transmutation. In the great majority of cases the infection was symmetrical. For calculation purposes the *Streptococcus viridans* was so ubiquitous as to preclude any useful comparison.

TABLE VII.—*Organisms in "Normal Tonsils."*

Organism.	—	In pure culture.
	Per cent.	
Streptococcus hæmolyticus	11	1
,, *viridans*	68	16
,, *non-hæmolyticus*	17	Nil
S. mucosus capsulatus	1	—
Micrococcus catarrhalis	21	—
Bacillus pfeifferi	6	—
Pneumococcus	10	—
Sterile	8	—
Staphylococcus albus only	5	—

I therefore took the *Streptococcus hæmolyticus* cases—36·5 per cent. Calculations show that this organism is not specially associated with pus or enlarged glands; it shows no predilection for subacute rheumatism (35 per cent.), or for infective arthritis C (42 per cent.). There was nothing to indicate any greater severity of the arthritis; and the results were only very slightly better than those for all cases—82 per cent. as against 78 per cent. The only fact that emerged was that which has been already stated under history—an occurrence in 42 per cent. of positive cases against only 22 per cent. in related cases. It appears to me probable that the *Streptococcus hæmolyticus* is associated with ordinary tonsillitis, acute or chronic, rather than with arthritis and the focal tonsil. I think that to this bacteriological class belong several patients whose arthritis has remained stationary or become worse, but who have clearly stated that their general health has considerably improved since the operation. It is significant that one case when first admitted had acute tonsillitis; culture of the pus from the crypt mouths produced *Streptococcus hæmolyticus*. A fortnight later the tonsils were removed and grew *Streptococcus viridans* only.

The 11 cases with neither *Streptococcus viridans* nor *Streptococcus hæmolyticus* show nothing characteristic.

There remains the problem of *Streptococcus viridans*, which is either an active agent in infective arthritis or is so common as to mean nothing. The evidence is in favour of the former; for, in brief, the *Streptococcus viridans* has been found associated with arthritis by many observers, has reproduced experimental arthritis in animals, and is a normal inhabitant of the mouth; its virulence is highly variable and, like other streptococci, and in their company, it probably leads a double life. It is accepted that a strain, at first harmless, may be made virulent by passage through animal tissues, and I am inclined to believe that the normal tonsil normally contains in its crypts the *Streptococcus viridans* in a quiescent state; that damage to the crypt epithelium occurs, that the organism meeting with a raw surface penetrates the tissues, becomes virulent, and, *given the proper conditions*—necessarily a wide term—produces substances sufficiently toxic to produce changes in joint and fibrous tissue, substances which are formed in proportion to the activity for the time being of the organism, and one of which is chemically neutralised by salicylates.

I think it must be admitted that the above analysis fails to show that a focally active tonsil possesses any peculiar characteristics by which it can be clinically identified.

Results of Tonsillectomy.

The results prove a little more illuminating. These numbers are based on accurate counts. They are derived from the signed statements of the patients

themselves, and in points of doubt I have not taken the benefit. The difficulty is one of interpretation. There are so many factors to be considered that only by cross-checking in every possible direction has it been possible to minimise the error of attributing success or failure to the wrong cause.

TABLE VIII.

Group.	Cured	Improved	Unchanged	Worse	Percentage cured and improved.
Subacute rheumatism	17	24	2	1	93
Infective arthritis C	14	56	8	7	82
" " D	1	9	4	6	50
Fibrositis	5	7	4	1	71
Neuritis	Nil	2	3	1	33⅓

In neuritis it is probable that the fibrous tissue survives the removal of the infective focus which caused it, ultimately contracts, and produces persisting pain by pressure. Tonsillectomy, therefore, can do little beyond preventing extension unless the disease is in its very early stages.

TABLE IX.—*Age as a Factor.*

—	Cured.	Improved.	Unchanged.	Worse.	Percentage cured and improved.
Up to 20 ..	12	23	2	2	89
Over 40 ..	2	27	2	5	80

As might be expected, results are better in younger patients. At the same time it is clear, from the figure of 80 per cent., that an age of 40 or over is no bar to a successful result.

TABLE X.

Age in years.		10 to 20.	21 to 30.	Average age— under	: :	over	31 to 40.	41 to 50.	51 to 60.	Over 60.
No. of cases	cured ..	12	16	28	: :	7	6	—	1	—
	worse ..	2	6	8	: :	9	4	1	3	1

In Table X. the proportion 28 : : 7 is exaggerated by the high percentage of good results in the subacute rheumatism patients, whose average age was low—25. These good results might appear to be due to this age factor, but are not so in reality. The improvement percentage of subacute rheumatism cases over 30 is still 91 per cent. Age, therefore, is not as important a factor as appears at first sight.

TABLE XI.—*Duration of the Systemic Disease.*

Duration.	Cured.	Improved.	Unchanged.	Worse.	Percentage cured and improved.
Under one year ..	33	44	7	6	85
Over five years ..	2	22	5	4	73

Of the 35 cured cases in Table XI. the duration was less than a year in 33. This high ratio is exaggerated by the fact that in 51 per cent. of the whole series the duration was less than one year, the duration numbers being as follows:—

Under one year	102	cases.
One to five years	55	,,
Over five years	43	,,

A duration of more than one year in subacute rheumatism, and more than three in "infective C" was exceptional. Duration, however, does appear to be a factor in prognosis. The results show that a complete cure is unlikely if the arthritis has lasted more than 12 months; but that after five years 73 per cent. of cases are still capable of improvement. I consider that a long duration in a patient over 40 should make one very carefully balance the rest of the evidence before embarking on tonsillectomy.

TABLE XII.—*Percentages Cured and Improved under Various Categories.*

Category.	Per cent.	Category.	Per cent.
Subacute rheumatism—		*Streptococcus haemolyticus*	
Under 30	94	cases	81
All cases	93	Enlarged glands	77
Related history cases ..	91	Duration more than five years	73
Aged 10 to 20	89	Fibrositis	71
Duration less than one year	85	Negative history cases..	64
Infective arthritis C—		Infective arthritis D ..	50
All cases	82	Neuritis..	33⅓
Under 30	82		

The importance of the figures in Table XII. must not be exaggerated. They represent a very small attack on the problem of chronic arthritis. During the time that these 200 patients were dealt with over 7000 cases of many and various forms of arthritis and allied conditions passed through the hospital. If, however, these results are better than those obtained without the aid of surgery they tend to confirm the focal infection theory. Possibly research into the histology of proved "focal" tonsils may reveal something of the barrier which stands between the system of one individual and an infection which, in another, results in such widespread tissue changes as are seen in chronic arthritis. S. J. Crowe,[1] working on these lines, has found ulcerated areas in the crypt epithelium of tonsils removed from patients with infectious arthritis (="infective arthritis" C).

Summary of Conclusions.

1. A probable tonsil focus can be found in a large number of cases of subacute rheumatism, chronic infective (focal) arthritis, and fibrositis.

2. When searching for a focus in the tonsils attention should be paid particularly to their history, size, colour, crypt contents, and to the associated lymphatic glands; and these points should be carefully balanced before deciding on tonsillectomy: (*a*) In an actively focal tonsil one or more of these points may be negative, but if all five are negative the tonsil should be assumed to be healthy. (*b*) The tonsil of chronic tonsillitis without systemic infection cannot be distinguished from the focal tonsil by physical signs or by present bacteriological methods, but only by inference.

3. In selecting cases for operation a history of tonsillitis associated with onset or recurrences is favourable in cases of infective (focal) arthritis, and to a lesser extent in subacute rheumatism, where such a history is commoner.

4. The younger the patient, and the shorter the duration of disease, the better the prospects, but within very wide limits neither age nor duration are a bar to success.

5. The bacteriological evidence, though insufficient to convict the *Streptococcus viridans* as the primary infective agent in chronic focal arthritis, increases the suspicion under which this organism already lies.

6. In the subacute rheumatism group the results are so good that the operation should become a routine part of the treatment, if only as a prophylactic against recurrences and later endocarditis.

7. In cases of chronic focal arthritis, if the balance of evidence, obtained as indicated in Conclusion 2, condemns the tonsils and they are completely excised, improvement may be expected in 80 per cent. of cases.

In conclusion, I have to express my gratitude for the help given me by my colleagues and others on the staff of the Royal Bath Hospital.

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PEMPHIGUS NEONATORUM.

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THE synonyms of "pemphigus neonatorum" are impetigo contagiosa neonatorum, bullous impetigo of infants, Ritter's disease, pemphigus contagiosus, and impetigo contagiosa bullosa.

It is a rare but highly contagious disease of the skin occurring in the new-born, usually between the fourth and fourteenth day after birth. It is characterised by the development on various parts of the body of vesicles, bullæ, or blebs, which rupture readily, leaving moist, red, smooth, glistening defects in the uppermost layers of the epidermis, which, in cases that recover, heal without a scar. Two forms of the disease are usually distinguished:—

1. A *mild type* in which the skin lesions are not numerous and tend to dry up and heal more or less quickly, and in which there is freedom from systemic disturbance. In this type recovery occurs within a few weeks.
2. A *grave type* in which the skin eruptions continue to arise and to extend over large areas of the body and in which there are febrile and other systemic manifestations.[1]

The distribution, as recorded by Cole and Ruh,[2] is universal, cases having been reported in Europe, America, Japan, and Asia. It occurs sporadically and in localised epidemics.

Historical.

Pemphigus neonatorum was first described in France in 1773 by Ochène.[3] In England an epidemic occurred in 1834 and was described by Rigby [4]; several mothers contracted the disease from their children, and Rigby himself was infected. Ritter recorded epidemics occurring in a foundling hospital in Prague between 1878 and 1880, with a mortality of 48 per cent. In 1886 Demme [5] studied the bacteriology, and isolated and cultivated a non-chromogenic diplococcus. In 1891 Almquist [6] described in the serum from a vesicle a diplococcus which on culture resembled the *Staphylococcus aureus*. This organism, on inoculation on the human skin, was found to produce a vesicular eruption, and in this way differed from the typical *S. aureus*, which commonly produces a follicular infection. Therefore Almquist suggested that the organism should be called *Micrococcus pemphigi neonatorum*. In 1900 Matzenaur [7] concluded that pemphigus neonatorum and impetigo contagiosa were due to the *S. aureus*, and that they were identical diseases. Some confusion has arisen from the fact that in the same year Sabouraud [8] came to the conclusion that the impetigo of Tilbury Fox (impetigo contagiosa of children and adults) was due to a primary infection with streptococci. Sabouraud found that if the blister contents were cultured in ascitic fluid a streptococcus grew after 48 hours' incubation, and that in equal quantities of broth and ascitic fluid, incubated for 24 hours, the cultures contained a mixture of streptococci and staphylococci, while if broth alone was used as the culture medium, and incubated for 12 hours, the fluid contained a few streptococci and numerous staphylococci. In 1903 Whitfield [9] described a case in which the date of onset was the seventeenth day after birth; two days later the mother developed a typical lesion on the hand. Cultures from the contents of a vesicle in a capillary tube of ascitic fluid, as described by McLeod,[10] produced a pure growth of streptococci from the child and of streptococci and *S. aureus* from the mother. It is to be noticed that Sabouraud was dealing with the impetigo contagiosa of Tilbury Fox, and that in Whitfield's case the date of onset was unusually late (17 days), so that he may have been describing a similar condition in an infant. We think these cases of streptococcus infection are to be distinguished from those of true impetigo contagiosa of the new-born.

In 1903 Maguire [11] described an epidemic of 18 cases, with a fatal result in eight; all the cases but one had come into contact with a nurse suffering from "pustular acne." In many instances infection was spread to other members of the family when the patient arrived home, producing in some typical bullæ. He states that in all the fatal cases the umbilicus became infected during the course of the disease. In the two cases investigated *S. aureus* was isolated. In 1906 Clegg and Wherry,[12] examining an epidemic at Manilla, agreed with Almquist that the coccus isolated closely resembled *S. aureus* on culture medium, but differed from it in that litmus milk was coagulated in a week and that no indol was produced in broth. The diplococcal arrangement could be reproduced in milk and serum-broth cultures. Experiments in animals failed to produce any typical lesions, but auto-inoculation produced a typical bulla in 30 hours; the organism, however, was not recovered from the lesion, which healed in 48 hours. In 1914 Cole and Ruh [2] described a series of eight cases, and grew *S. aureus* in pure culture in each. In 1917 F. H. Falls [13] described his very complete investigations on a series of 69 cases which occurred at Chicago in 1915 and 1916, and concluded that the disease was caused by infection with *S. aureus*, and that this differed from other staphylococcal infections in that the organism produced vesicular eruptions on inoculation into man, and also that in certain liquid media it appeared as a diplococcus which formed short chains. A staphylococcus is also cited as the causative agent by a number of continental writers in recent years: Weiland 1922,[14] Shultheiss 1923,[15] Stern 1927,[16] and Richter 1927.[17] In 1925 Millon, Caldwell, and Winians [18] described an outbreak in which the infecting agent was a *S. aureus*, derived, they considered, from the mother's milk. We have investigated the matter, and have concluded that this is an unlikely and unusual method of infection.

Cases Examined by the Present Writers.

We have had the opportunity of observing two epidemics and one further isolated case in the lying-in wards of a general hospital, and two cases at a lying-in hospital; these institutions will be referred to as hospitals A and B respectively. In March and April, 1927, an epidemic of 18 cases occurred in the maternity wards of hospital A. The average age at onset was six or seven days, the youngest infant being 4 days old and the eldest 12 days. The eruption began on the head, face, or chin in 11 cases, and in the other cases appeared first on the fingers, arms, wrists, axillæ, shoulders, neck, legs, or toes. In all cases where fluid could be obtained from an unbroken vesicle *S. aureus* was grown in pure culture and no other organism was obtained. The interval between the cases varied from one to nine days. As soon as the diagnosis was certain the mother and child were isolated from the other maternity patients. During this time a nurse attending the babies was found to be suffering from "a series of boils," and when she left the ward the epidemic ended.

In July, 1927, there was a small epidemic of four cases. The age of the babies at the onset varied from 5 to 16 days, the eruption broke out on the fingers in two cases, the neck and head in one case, and the toes in one case. From all vesicles examined *S. aureus* was grown in pure culture. The interval between the cases varied from one to ten days. In this outbreak no primary source of infection could be found, and we therefore proceeded to make observations as to the occurrence of *S. aureus* in the normal child and mother. (These will be referred to later.) A few days after the first case was transferred to the isolation ward the nurse under whose care it had now come developed a vesicular eruption on her knuckles from which a *S. aureus* was isolated.

In January, 1928, a solitary case occurred at hospital A. The child was 10 days old at the time

of onset, and had the typical bullous eruption on the fingers of the left hand, the back of the neck, and just external to the nostril. A pure culture of *S. aureus* was obtained from the blister fluid. The mother was then found to be suffering from a perionychial infection of the bullous type, which she had first noticed four days before the onset of the eruption on the child. The mother's lesion was cultured when the child was first seen, at which time it was in the stage of recovery, and *S. albus* was found in pure culture.

In February, 1928, we were fortunate enough to have permission to examine two cases which occurred in hospital B. Both began on the same day, in infants 4 days old. One child had a lesion on the right thigh and the other a lesion on the right shoulder. When first examined by us the vesicles had already ruptured and had been covered by a weak mercurial ointment; a culture was taken, however, by raising up the edge of the broken bulla, and in each case *S. aureus* was obtained in pure culture. We think it probable that these infants were infected by the nurse who had attended them on the day of birth, for on the following day she reported that she had for a day or two noticed a small pustular vesicle on the hand. She was sent off duty, and while off duty a week later a similar vesicle occurred on another finger. In all these cases constitutional symptoms were absent, except in two cases with extensive exfoliation, and the umbilical scar was unaffected.

Our cases show a probable source of origin of the first epidemic in a nurse with "boils," after whose departure the epidemic ceased; this was a temporary nurse from outside the institution, and no accurate note of the nature of the lesion was made. In the second epidemic no original cause was found, but the infection of a nurse from a baby occurred. In the third a pre-existing vesicular eruption was present in the mother. In the fourth a nurse with staphylococcal vesicles of the hand was considered to be the cause. The direct contagiousness to and from adults, and the fact that, in nearly every case, the vesicular infection remains true to type is well illustrated.

Bacteriology of the Epidemics.

We found no streptococci and no infecting agent except *S. aureus*. We examined blisters in their very early stages and found organisms present in considerable numbers; whilst many of these were in diplococcal rather than in staphylococcal form, we have not found, either in films or cultures, anything that could properly be called a streptococcus. In cultures, more especially perhaps on serum-containing fluids, the cocci may take up a chain form of three or four members, but this is also found in cultures of *S. aureus* from any active lesion. On solid medium, such as serum-agar, the staphylococcal arrangement once more becomes apparent. The relative lack of pathogenicity of the organisms when injected into mice shows the character of a staphylococcus rather than a streptococcus, and this we found whether we injected the blister fluid itself or the cocci grown from it.

The *S. aureus* isolated in some five cases was fully tested and found to be hæmolytic; it acidified milk but without clotting, and no indol was produced in peptone water. In these and in the sugar reactions we found no fixed differentiating character from the ordinary *S. aureus* isolated from boils and carbuncles, cultures from two of which were examined in parallel with those from the pemphigus blisters as controls. The staphylococcus characteristic of pemphigus neonatorum differs from that commonly isolated from boils and other follicular infections of the skin in that it produces vesicular lesions, not only in the new-born child but also in those cases in which we have been able to trace the passage from a child to an adult.

In three cases fluid from blisters was inoculated direct into a mouse subcutaneously; it had no lethal effect, and streptococci were not found in the blood stream.

Examination for a Filterable Virus.

We have also sought for a filterable virus which might be acting as a primary infecting agent or as an adjuvant to the cocci. Fresh fluid from the blisters was injected intradermically into the footpads of guinea-pigs and mice (five cases). In these circumstances the relatively small numbers of staphylococci present have no harmful effect, whereas if a filterable virus were present we might expect a herpetiform eruption. Our results were entirely negative. As a contrast we examined one child of 6 months with a typically bullous eruption, and on culture of the blister-fluid both streptococci and staphylococci were grown in ascitic fluid media. We concluded that the patient was suffering from the impetigo of Tilbury Fox, thus confirming the work of Sabouraud and Whitfield, and further differentiating the ætiology of pemphigus neonatorum from that condition.

Types of Outbreak.

The epidemics we have traced in the literature seem to fall into three classes:—

1. Those of a violent and rapidly spreading type like those described by Rigby[4] and Ritter. In these instances one must presume that there has been a direct transmission of the virus from case to case. This direct transfer makes both for rapidity of spread and, by "passage" of the organism, for increased virulence and higher mortality.

2. Epidemics such as that described by Schultheiss,[15] in which a large number of cases were infected from the same source in a short space of time. The sudden widespread nature of the epidemic in this instance led to the implication of the institution laundry, and it was found that the clean linen was being sorted by a person with a suppurating perionychia.

3. The common type of epidemic, such as that with which we have had to deal, and which consists usually in a series of mild cases. In these we suspect some constant carrier of infection, but have not always succeeded in identifying it.

Schultheiss [15] refers to cases of infantile conjunctivitis during the epidemic. We have noted the same thing, both during the epidemic and also during periods when the wards were entirely free from pemphigus. Cultures from most of these cases grew *S. aureus* only, and it seems probable that this infection is closely allied to pemphigus neonatorum.

Mortality.

The mortality in the earlier epidemics described by Ritter and Maguire was 48 per cent., but recently it has been very much less, and in our own series there were no fatal cases. It has been repeatedly found that involvement of the umbilicus, with its large, recently clotted vessels, is likely to lead to pyæmia and death. Undoubtedly the low mortality in recent epidemics is related to the immediate isolation of infected cases and to the modern aseptic treatment of the umbilical scar.

Spread of Infection.

Wherever in our cases we have been able to trace the conveyance of infection either from the adult to the baby or vice versa the infection has been, with one doubtful exception, of a pemphigoid character. We therefore think it probable that a lesion of pemphigoid type, whether in an adult or infant, is much more likely to arise by infection from a similar blister lesion than from the ordinary follicular type of staphylococcal infection. If the staphylococcus is, as we believe, the cause of the infection we must look for direct contagion by transfer from case to case or from parent or attendant. In addition to direct contact infection Schultheiss's epidemic shows a conveyance by fomites (i.e., linen).

Auto-infection.—The possibility that the infective organism is present on the skin and causes an infection as a secondary effect of some constitutional condition cannot be overlooked. We see instances of this sort in certain trophic and toxic conditions, for instance herpetic eruption or the pustule of

small-pox, in which the staphylococci take root in the cutaneous tissues, apparently as a result of a central infection by some other virus. *S. aureus* may be found on the normal baby, but our own experimental work and that of Falls does not support the thesis of an infection arising spontaneously in this way, nor of a primary infecting factor which might let in *S. aureus* as a secondary invader. Dr. Gregorson in a recent article [19] speaks of a toxic neuritis in certain motor nerves, but it is difficult to see how this could be related to cutaneous infections, nor have we noted the constitutional enfeeblement to which he refers in either mother or child.

Possible Sources of Infection.—We have shown one source of infection in some of our cases to be specific blister infections of the skin due to staphylococci, but in other cases and in some reported epidemics no such source has been demonstrated. We therefore decided to investigate the occurrence of *S. aureus* in the milk and throats of mothers in the antenatal and puerperal states, and also to investigate the incidence of this organism on the recently born healthy infant. We found in the antenatal clinic (attached to hospital A) that *S. aureus* occurred in 12 per cent. of throat swabs from 66 patients. An examination of the breast secretion in 34 cases showed that the *S. aureus* occurred in one case only, or 3 per cent.; 36 per cent. were found to contain *S. albus* and 60 per cent. were sterile. In the puerperium 83 throat swabs were cultured, and of these 15 per cent. contained *S. aureus*. In 58 cases in which we cultured the milk 17 per cent. contained *S. aureus*. We then investigated 25 normal babies from 4 hours old to 9 days old; in each case a swab from the nose, the skin, and the umbilical cord or scar was cultured. The outstanding feature of this investigation was the frequent presence of *sarcina lutea* in all the situations examined. *S. aureus* was found twice in the nares and three times in the umbilical scar, but in no case on the ordinary skin surface. In the three cases where *S. aureus* was found on the child the mothers were investigated also, but no coccus was grown from either throat or milk. From this investigation we concluded that the bacteriology of the infant's skin, nose, and cord has no close relationship to that of the mother's milk or throat.

In the last three cases of impetigo neonatorum investigated we carried out bacteriological examinations of the mother's milk and throat and found that the *S. aureus* was not present in either; moreover, this organism was not found on the children's skin apart from the lesion, nor about the umbilicus or nares. In these three cases a definite source of infection was found elsewhere; in the first case the mother had a perionychial vesicular infection, and both the last two cases were attended on the day of birth by a woman with an infected vesicle on her finger.

S. aureus, therefore, may be carried in what appears to be a harmless form on various regions of the body in both adults and babies. It is fairly common in the throats of quite healthy people. We have found it in the colostrum of pregnant women some weeks before delivery and in the milk after delivery; if there is any congestion of the breast it is fairly often present. The organism found in most instances presents the cultural and biochemical characters of *S. aureus* as isolated from suppurating lesions such as boils or pemphigus blisters. In addition to these sources among apparently healthy people it is certain, from the frequency of mild infections of staphylococcal type such as blepharitis and small cutaneous pustules, that new-born babies must frequently come in contact with this infecting agent. In spite of this the disease remains comparatively rare, and it seems probable that the ordinary cutaneous pyogenic infection is at any rate less likely to lead to pemphigus in contacts than is a specific type of blister lesion.

In all the routine biochemical tests we have not found the staphylococcus of pemphigus neonatorum to differ from that of follicular abscesses, and in this our findings for the most part confirm those of other workers.

Conclusions.

(*a*) Pemphigus neonatorum is due to a primary infection with a *S. aureus*—i.e., one indistinguishable biochemically and culturally from the *S. pyogenes aureus*.

(*b*) In most cases the primary source of infection can be traced to a septic focus on the mother or on one of the attendants who come directly or indirectly in contact with the infant. In our cases the septic focus was in nearly every case of the blister type, and we consider that probably this type of lesion is much more apt to lead to pemphigus infection than the commoner types of staphylococcal lesion such as follicular abscesses.

(*c*) *S. aureus* is frequently found in the throat and milk of mothers before and after childbirth, but this cannot be considered the usual primary source of infection.

(*d*) In fatal cases it is found that the umbilicus has usually become inflamed and it should therefore always be kept as clean as possible.

(*e*) Our experiments, although limited in number, do not support the thesis of a filterable virus.

Our conclusions differ slightly from those set out in the Ministry of Health Memorandum, in that we believe the staphylococcus to be the sole cause of the infection. We further think that conveyance of the infection is usually from a blister type of lesion—that is to say, from a superficial infection of the skin, including, for instance, an infective eczema. We also think that the staphylococcal conjunctivitis sometimes seen in the new-born may be an allied condition.

Suggested Measures During an Outbreak.

Infected cases should be isolated.

Bed, bedding, &c., should be sterilised, but burning it should be entirely unnecessary.

All other infants should be carefully examined for possible early stages of infection, and for allied infections such as conjunctivitis.

The mother and attendants should be examined for septic conditions and the laundry staff for possible infection, including any recent history of cutaneous infection, especially of the bullous type. In this inquiry the wholehearted coöperation of the nursing staff must be carefully sought. It is very important that they should not, as so often happens, get the wrong impression and be made to feel that there is any imputation against their skill or cleanliness.

If the epidemic continues it might be well to cease bathing all new-born babies and substitute rubbing the skin with sterile oil.

In all cases of pemphigus neonatorum particular attention should be paid to keeping the umbilicus healthy, and it should be dressed, apart from the general toilet, with a dilute mercurial ointment, as a prophylactic measure.

Our thanks are due to Dr. E. I. Clark for help with the bacteriological work of this investigation.

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A STUDY OF PASSIVE IMMUNISATION IN SCARLET FEVER.

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Any procedure which will cut short an outbreak of infectious disease must be regarded from all points of view as of very great value. Its value to the contact cannot be over-estimated, for by its means he may escape an attack of the disease and the consequent possible risk to life and well-being, certain loss of time, and in many cases financial loss. Also it is obvious that when the outbreak occurs in hospital and when quarantine has to be observed a certain proportion of the contacts are bound to be detained for a longer or shorter period after they are fit to return home. Should a secondary case arise this period must, of course, be lengthened by another quarantine period and, considering the problem from the standpoint of hospital administration, any method of obviating or reducing quarantine periods must result in a considerable saving of patients' accommodation and expense. In a clinical investigation of the new work on scarlet fever [1] one of us demonstrated that a passive immunity to scarlet fever could be brought about by the injection of scarlet fever antitoxic serum, and it was to make a detailed study of this phenomenon and to test its practical possibilities in the limitation of outbreaks of scarlet fever in the non-scarlet fever wards of an infectious diseases hospital that the following work was carried out. Our study has extended over a period of two years; observations have been made in 40 separate outbreaks of scarlet fever and include the immunisation records of over 250 individuals. Other workers have employed the method, particularly in children's [2] and infectious hospitals [3 4 5 6] throughout the country, and it appears to have been successful both when the immunity was estimated by the Dick test and when it was assessed in terms of actual resistance to the disease.[4 7] The dosage now generally recommended is from 2·5 to 5 c.cm. of the concentrated antiserum, but, as James [8] has pointed out, comparatively little work has been published in this country on the amount of antitoxin necessary to secure protection. As a result of his investigation he came to the conclusion that 5 c.cm. is usually sufficient to protect susceptible contacts for a minimum period of seven days, but that certain highly susceptible individuals giving a strongly positive Dick reaction probably required 10 c.cm. Cruickshank [9] has also worked at this problem and states that in general 2·5 c.cm. of a concentrated antitoxin protects for three to six days, 5 c.cm. for seven to ten days, and 10 c.cm. for two or three weeks, and in another paper [10] he indicates that the immediate protection afforded by different doses of the antitoxin does not vary very much, but that the chief effect of increasing the dose is to bring about a more lasting immunity.

Methods.

On the occurrence of a case of scarlet fever in a non-scarlet ward the cross-infected case was promptly isolated and search made for a probable infecting case. One of two measures was then adopted, attempts being made to limit the outbreak either by quarantining the ward or by protecting the exposed susceptibles, after which quarantine was removed. As far as possible these measures were used alternately, so that the results of the passive immunity experiments were controlled by those in which quarantine was observed. Since all the wards in which scarlet fever appeared contained an average number of 20 beds, the total numbers exposed would be comparable. In the passive immunity experiments all contacts were Dick-tested immediately, the results being scrutinised after 24 hours and classified as follows: Reactions under 10 mm. in diameter Class I., from 10–20 mm. Class II., from 20–30 mm. Class III., and above 30 mm. Class IV. Following the practice of other observers, we have for practical purposes regarded Class I. reactors as immune. The susceptibles were then given their injections of scarlet fever antitoxin by the subcutaneous or intramuscular route, and were re-tested at an interval of 24 or 48 hours and at weekly intervals until they became positive again or were discharged from hospital. The toxin used in the testing was supplied by Dr. Hartley, of the Medical Research Institute. We were conversant with its properties and we have proved it over a long series of comparative tests to be exactly comparable with the Dick reagent used extensively in this country. The antitoxin was the ordinary commercial preparation put on the market by two well-known firms.

Immediate Results of Various Doses of Antitoxin.

In an attempt to decide upon the optimum dosage sufficient for immediate and complete protection we have employed injections of 3 c.cm. in 57 cases, 4 c.cm. in 41 cases, 5 c.cm. in 120 cases, and 10 c.cm. in 43 cases. On re-testing we found that after a 3 c.cm. dose 51 individuals (89·4 per cent.) became Dick-negative; after 4 c.cm. 40 (97·5 per cent.) became Dick-negative; after 5 c.cm. 101 (84·1 per cent.) became Dick-negative; and after 10 c.cm. 41 (95·3 per cent.) became Dick-negative.

These results raise some very interesting practical questions. For instance, it is a matter of considerable importance to find in a significant series of cases that 5 c.cm., which has come to be widely recommended as a suitable dose for the purpose, fails to confer passive immunity in 16 per cent. of cases, and that even by doubling this dose we cannot be sure of conferring a passive immunity on every case. It is also interesting to find that 3 c.cm. and 4 c.cm. doses seem to be as effective as the larger amounts. In considering these results as a whole, three factors occur to us as requiring attention. These are the possible variation of antitoxic content of various batches of serum, the question of age, and the state of susceptibility of the patient. Examination of the individual results in the various groups of patients immunised at any single time shows that no great variation in antitoxic content in the various batches could be detected. The 5 c.cm. series, the largest, was composed of 11 groups, each consisting of from 8 to 15 susceptibles. Only in three of these did we obtain a complete group immunity after protection, whereas in the remainder, according to the smaller or larger numbers comprised in the group, there were one, two, or three failures, and in no experiment were the unsuccessful cases concentrated in any single group. The same fact emerges from an analysis of group results in the other series. The question of age has also been examined; in the 5 c.cm. group there were seven failures to protect among 57 children under the age of 5, or 12·2 per cent. In the age-group 5–10, consisting of 47 children, there were 13 failures, or 27·6 per cent., and in the age-group 10–15 there were 5 failures out of 12, or 41·6 per cent. In spite of the fact that this important point is not brought out in either of the series immunised with 3 c.cm. or 4 c.cm.—all the failures in these being scattered indiscriminately throughout the age-periods under 5—we are inclined to attach importance to the suggestion implied in the analysis of the larger numbers, and feel that in considering dosage regard should be paid to age. The question of susceptibility also requires attention, and we have been able by grading our reactions to correlate this factor with the results of passive immunisation. In the 5 c.cm. series we find that this dose failed in 7 out of 16 Class IV. reactors (43·7 per cent.), in 9 out of 52 Class III. reactors (17·3 per cent.), and in 7 out of 52 Class II. reactors (13·4 per cent.). Unfortunately the Dick reactions were not graded in the 4 c.cm. series, but most of the 3 c.cm. series and all of the 10 c.cm. were graded, and an analysis of these brings out the same point. Our failures may partially be ascribed, therefore, to the high susceptibility, as shown by the Dick test, of a proportion of the patients. From a study of our records we find that after intramuscular inoculation of the protective dose 6 per cent., and after subcutaneous injection 11 per cent. of positive

Dick re-tests at a 24-hours' interval subsequently became negative, whereas after a 48-hour re-test further change in the reaction was unlikely. We are therefore inclined to recommend the intramuscular route to secure as rapid absorption as possible, and that a 48-hour interval be observed before re-testing to estimate the effect of immunisation.

Duration of Passive Immunity.

This is a matter of some importance and, on the analogy of other infections in which it is possible to produce this type of protection, we should not expect it to be of long duration. It is generally considered that, to be of value, passive immunity in scarlet fever should at least endure beyond the limit of the incubation period—i.e., for 7–10 days. On consulting the table it can be seen how far that demand is satisfied by different doses. For various reasons we were not able to follow up all our cases until they returned to their original positive reaction, but in each series of cases we think we have been able to follow up a sufficient number as far as the end of the second week to supply a satisfactory figure on which to calculate the probable number of negatives if all had been re-tested, and thereby establish a percentage in which the probable error is not great. Again the results vary with such irregularity that it is difficult to draw conclusions. We find that at the end of the first week, after a 3 c.cm. dose 75·4 per cent., and after a 4 c.cm. dose 92·6 per cent. are still negative, but after a 5 c.cm. dose only a little over half, 56·6 per cent., have not relapsed to the state of susceptibility. At the end of the second week there is a further falling off

Table showing Incidence and Duration of Passive Immunity after Various Doses of Scarlet Fever Antitoxin.

Dose: c.cm.	Date of re-test.	Total.	Pos.	Neg.	Negs. not re-tested.	Prob. neg.*	Per cent.
3	1–2 days	57	6	51	—	—	89·4
	1st week	39	6	33	12	43	75·4
	2nd „	24	9	15	9	27	47·3
	3rd „	12	3	9	3	—	—
	4th „	7	3	4	2	—	—
	5th „	4	0	4	—	—	—
4	1–2 days	41	1	40	—	—	97·5
	1st week	39	2	37	1	38	92·6
	2nd „	32	12	20	5	24	58·5
	3rd „	5	2	3	15	—	—
	4th „	2	2	0	1	—	—
5	1–2 days	120	19	101	—	—	84·1
	1st week	95	31	64	6	68	56·6
	2nd „	51	16	35	13	47	39·1
	3rd „	29	13	16	6	—	—
	4th „	10	4	6	6	—	—
10	1–2 days	43	2	41	—	—	95·3
	1st week	36	1	35	5	40	93·0
	2nd „	28	3	25	7	36	83·7
	3rd „	21	8	13	4	—	—
	4th „	6	0	6	7	—	—

* Prob. neg. = Probable number of negatives if all surviving negatives from previous re-test had again been re-tested.

in the numbers, the 3 c.cm. and 4 c.cm. series now showing 47·3 and 58·5 per cent. respectively of negatives, whilst the 5 c.cm. series give a smaller percentage still—viz., 39·1. Again, the 10 c.cm. results are the most satisfactory since, although the percentage of negative results immediately after immunisation is not so high as obtained with the 4 c.cm. dosage, 93·0 and 83·7 per cent. of negatives at the end of the first and second weeks respectively may be regarded as satisfactory. This result also confirms the observation of Cruickshank that increasing the dosage for passive immunity in scarlet fever tends rather to prolong the duration of protection than to give a great increase in the number of negative reactions. It may be fair to attribute the better results obtained in the 3 c.cm. and 4 c.cm. series, when compared with the 5 c.cm. series, to the smaller total numbers involved, and if we do so, then we must regard the 10 c.cm. series as the only satisfactory one from the point of view of persistence.

During the course of the investigation eight cases previously passively immunised subsequently developed scarlet fever, and, since these have a direct bearing on the protective value of the process and also on the duration of the immunity, details are appended:—

CASE 1, aged 5. Exposed on Feb. 9th, 1928, and found Dick-positive. On the 10th given 5 c.cm. antitoxin. On the 12th was still Dick-positive and developed scarlet fever on that date—i.e., two days after immunising injection.

CASE 2, aged 6. Exposed Feb. 6th, 1928, and found Dick-positive. On the 10th given 5 c.cm. antitoxin. On the 12th was Dick-negative and developed scarlet fever on that date—i.e., two days after immunising injection.

CASE 3, aged 10. On Oct. 27th, 1927, was Dick-positive. Exposed Nov. 16th. On the 17th given 5 c.cm. antitoxin. On the 18th was Dick-positive and on Nov. 21st took scarlet fever—i.e., four days after immunising injection.

CASE 4, aged 15. Exposed Dec. 13th, 1926, and found Dick-positive. On the 14th 3 c.cm. antitoxin. On the 15th and 21st was Dick-negative. On the 24th was Dick-positive and took scarlet fever—i.e., ten days after immunising injection.

CASE 5, aged 3. On March 24th, 1927, was Dick-positive. Exposed April 14th. On the 15th given 4 c.cm. antitoxin. Was Dick-negative on the 16th and 21st, but Dick-positive on the 28th. On May 3rd took scarlet fever—i.e., 19 days after immunising dose.

CASE 6, aged 8. On July 20th, 1927, was Dick-positive. Exposed on the 22nd. On the 23rd given 5 c.cm. antitoxin. August 1st was Dick-negative, but found Dick-positive on the 8th. On the 12th took scarlet fever—i.e., 20 days after immunising dose.

CASE 7, aged 2. Exposed April 15th, 1928, and found Dick-positive. On the 16th given 5 c.cm. antitoxin. On the 18th was Dick-negative, but on the 25th and May 2nd was Dick-positive. On the 9th took scarlet fever—i.e., 23 days after immunising dose.

CASE 8, aged 7. On Oct. 27th, 1927, was Dick-positive. Exposed on Nov. 16th. On the 17th given 5 c.cm. antitoxin. On the 18th was Dick-negative, but on the 25th and Dec. 2nd was Dick-positive. On the 15th took scarlet fever—i.e., 28 days after immunising dose.

It is interesting to note from these cases that in all except the second the presence or absence of immunity was correctly indicated by the Dick test. It is difficult to explain Case 2, except on the ground that it probably falls into the varying percentage of cases of scarlet fever which practically all workers have found to be Dick-negative even in the earliest stages of the disease. We suggest that the first three cases were incubating scarlet fever at the time of immunisation, and that the protective injection of 5 c.cm. of antitoxin did not succeed in blocking the onset and apparently failed to have much effect in modifying the incubation period, assuming that all three were the direct consequence of their respective primary infecting cases. All cases, however, were mild and without complications. Whatever the explanation, their occurrence seems to point to the necessity for a serum which in reasonably small doses will confer a more certain immunity. The remainder of the cases serve to emphasise the fact that, while passive immunisation may carry the susceptible contact over the immediate dangers of an exposure, it is transient and fails to protect against subsequent exposures at as short a space of time as three or four weeks after the first.

Comparison of Quarantine and Immunisation Methods.

In 21 of the 40 outbreaks studied the usual methods of quarantine for ten days were carried out. Of these 11 ended without further cases developing within the quarantine period, but in ten instances secondary cases appeared, resulting in the infection of 13 individuals. In the 19 outbreaks dealt with by passive immunisation 17 were free from the occurrence of subsequent cases within ten days of the appearance of the primary case. In two outbreaks, however, secondary cases did appear. These numbered three, one outbreak being responsible for Cases 1 and 2 detailed above, and another for Case 3. These figures give a clear indication of the protective value of passive immunisation and constitute a strong argument

in its favour. Perhaps less important than the actual prevention of cases of scarlet fever, but nevertheless of considerable moment to those responsible for hospital administration, is the saving in accommodation. By reducing the period of quarantine from ten to three days, the time occupied by testing and immunising, there was a clear saving of seven days in each of 19 outbreaks, or a total of 133 days—i.e., roughly four and a half months in two years. If the quarantined outbreaks had been immunised as well we should have been able to double that gain, so that the equivalent accommodation of one ward for four and a half months in one year would have been set free.

Serum Reactions.

Since the majority of our scarlet fever cross-infections occurred amongst diphtheria patients who had been sensitised to horse serum, it was inevitable that there should be a fairly heavy incidence of serum reactions. For the same reason it was often quite impossible to determine whether to attribute any given rash to the therapeutic diphtheria antitoxin or the scarlet fever prophylactic, and we cannot offer any statistical evidence on this point. When patients had received diphtheria antitoxin more than ten days previously they were desensitised by an injection of 0·5 c.cm. of normal horse serum. Serum sickness was confined to local reactions and generalised urticarial rashes, and, while inconvenient, the symptoms were transient and no serious effects were produced.

Discussion.

This phase of development of the recent work on scarlet fever has not by any means reached finality. We had hoped to be able to outline a plan which could be adapted to any outbreak and which, involving no more trouble than a preliminary Dick test followed by the immunising dose, could be relied upon to give a solid immunity of a reasonable duration. Experiment has shown that the problem of passively immunising the susceptibles in an exposed ward-population cannot yet be reduced to these terms, and it seems to us that the chief part of the difficulty is due to the fact that we are working with a relatively weak antibody. This is apart from the handicap imposed by the fact that no method of standardisation has yet been evolved which can provide us with an exact measure of the antitoxic content. In spite of these limitations we think the case for passive immunisation is strong. It is true that the present type of scarlet fever is mild, but in the past we have seen death resulting from scarlet fever complicating other acute infections and also such operations as that for cleft palate. If we add the administrative advantages in the saving of hospital accommodation, and economic advantages to adult patients in the avoidance of loss of working-time, we consider that this procedure provides an opportunity which no one can afford to dismiss.

The results in attempts to limit outbreaks of scarlet ever by passive immunisation are encouraging, but complete efficiency requires the introduction of an antiserum comparable in potency with that of diphtheria antitoxin. At present we suggest that susceptible contacts up to the age of ten years giving a Dick reaction of less than 30 mm. diameter should receive 5 c.cm. antitoxin intramuscularly and should be Dick-tested again after 48 hours, the dose to be repeated in positive reactors. Contacts over 10 years of age and those of any age giving a reaction of 30 mm. or over should receive an initial dose of 10 c.cm.

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OBSERVATIONS ON THE SEDIMENTATION RATE IN PULMONARY TUBERCULOSIS.

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IN November, 1926, we began an investigation to determine the value of the sedimentation rate in the diagnosis and prognosis of pulmonary tuberculosis. The method adopted was that used by the late Dr. Arthur Inman, of Brompton Hospital, which differs from the usual methods in that very small amounts of blood are taken, permitting frequent examinations over long periods. Various methods of treatment were thus investigated—ordinary sanatorium routine, artificial pneumothorax, and sanocrysin.

Technique.

To two volumes of a sterile solution of 3·8 per cent. sodium citrate eight volumes of blood are added. The unit of volume is one drop of blood from a broad-ended glass pipette; the blood is drawn from an ear or finger and mixed in a watch-glass. A column of the diluted blood, 4 inches (=100 mm.) long, is drawn by capillary attraction into a fine glass tube about 6 inches long and of 2 mm. bore. The tube is sealed with sealing wax and placed vertically in a bed of plasticine. In this investigation the length of the clear fluid column above the sedimented red cells was measured at the end of an hour, in millimetres, this giving the result directly as a percentage. Any reading above 6 mm. for a man and 12 mm. for a woman is considered abnormal. In cases investigated over a long period the results were plotted in graph form (Fig. 1).

All cases entering the sanatorium were investigated a week after admission and at monthly intervals until discharged. Cases undergoing pneumothorax treatment were investigated once a week for the first month and afterwards every fortnight.

The Test in Diagnosis.

It has been proved by many investigators that the sedimentation test has little value in diagnosis and this agrees entirely with our findings. Of the 360 cases who entered the sanatorium during the period covered by the investigation 318 were clinically tuberculous, while in the remaining 42 no positive evidence was obtained. In these patients the changes in the sedimentation rate were as follows:—

A. *Clinically Tuberculous Cases.*

Sputum.	Sed. rate. Normal.	Sed. rate. Increased.	Total.
T.B. + ..	3	230	233
T.B. — ..	6	79	85
All cases	9	309	318

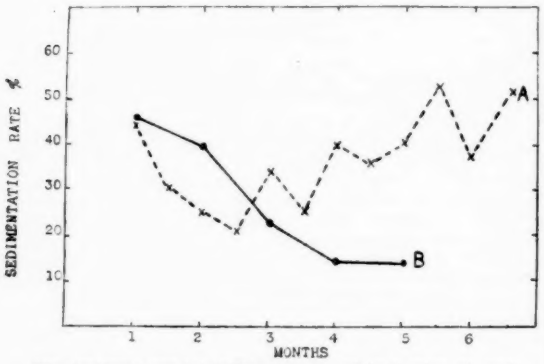
B. *Clinically Non-tuberculous Cases.*

—	Sed. rate. Normal.	Sed. rate. Increased.	Total.
Nil found ..	18	3	21
Other chest conditions..	8	7	15
Non-pulmonary conditions..	3	3	6
All cases ..	29	13	42

Thus, of 318 clinically tuberculous cases, 309, or 97 per cent., gave an increased sedimentation rate, while 9, or 3 per cent., gave a normal figure. Of the 42 clinically non-tuberculous cases, 29, or 69 per cent., gave a normal figure, while in 13, or 31 per cent., the rate was raised. These results indicate that, while an increased sedimentation rate may be used in conjunction with clinical findings to assist in the diagnosis of pulmonary tuberculosis, yet its usefulness in this respect is more than modified by the fact that other

chest conditions give a high percentage of positive results, while a definitely tuberculous case may give a normal figure; this is repeatedly demonstrated in cases after treatment. On the other hand, in its

FIG. 1.



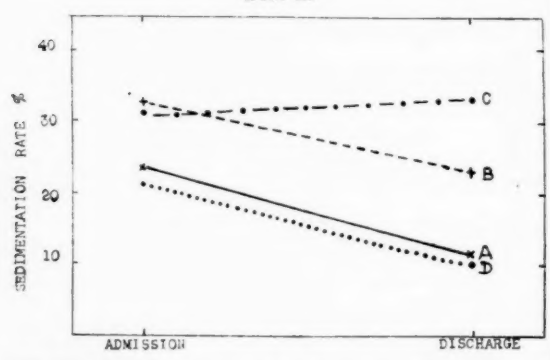
Illustrating cases (A) failing to respond to treatment, and (B) making satisfactory progress.

indication of response to treatment the test seems to have definite and unique value, and thereby to justify its use. Both in following up the progress of individual cases and in observing the results of treatment on patients as a whole a marked correlation has been found between the fluctuations in sedimentation rate and the clinical findings. This has been shown to hold good for all types of cases and treatments; the figures obtained bring out some interesting features.

Ordinary Sanatorium Routine.

One hundred cases, sputum "T.B. positive" on admission and under ordinary routine treatment only were observed over a period of not less than four months. On their clinical condition on discharge these patients fall into three classes: (A) Improved and arrested, with "T.B.—" sputum. (B) Improved but still with "T.B.+" sputum. (C) Stationary or worse. The average fall in sedimentation rate for the 100 patients was from 28 per cent. on admission to 22 per cent. on discharge, a definite but by no means striking improvement. The following graph illus-

FIG. 2.



trates, however, the difference in the degree of improvement according to the class of case (Fig. 2).

In Class A the fall in sedimentation rate (23 per cent.–12 per cent.) is very definite and practically reaches the normal on discharge; Class B shows an equally good fall in sedimentation rate (32 per cent. –22 per cent.), but begins and ends on a much higher level; Class C shows no improvement (31 per cent. –32 per cent.). A further graph, Class D, is added for comparison; it is based on 30 cases, "T.B. negative" on admission. This line is almost parallel with that of Class A.

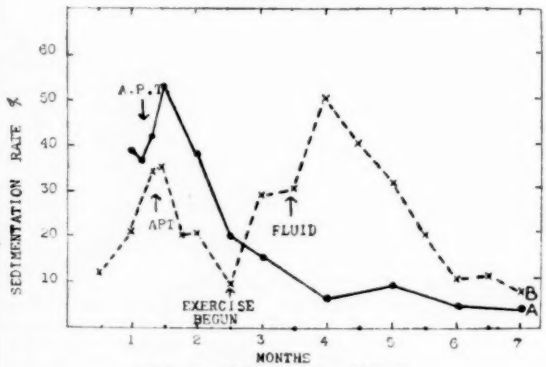
Isolated readings are useless owing to the rapid and striking reflection in the sedimentation rate of such complications as dry pleurisy, onset of fluid in a pneumothorax case, mental shock, &c. Even minor causes, such as worry, colds, falls, cauterisation of the larynx, teeth extraction, &c., though they do not affect the temperature chart will temporarily upset the sedimentation readings. But, allowing for these complications, if readings are taken at regular intervals the general trend of the sedimentation rate indicates clearly whether or not the progress of the patient is satisfactory. Fig. 1, which shows two typical cases, might be multiplied indefinitely.

Special Treatment.

It is of the greatest interest to follow the changes in the sedimentation rate in patients undergoing special treatment; this has been done most thoroughly in artificial pneumothorax cases. Typically in such cases there follows a slight rise of varying intensity, due perhaps to worry and shock, perhaps to sudden increase of auto-inoculation from the pushing down of the diseased lung. This, in an uncomplicated case, generally precedes a steady fall to a normal level (Fig. 3 (A)).

The first exercise following the absolute rest enjoined in the early stages in all cases of pneumothorax treatment produces a slight rise in the sedi-

FIG. 3.



A.P.T. = artificial pneumothorax.

mentation rate, soon corrected and often repeated with increasing movement. As previously mentioned, the onset and withdrawal of fluid invariably cause a startling increase (Fig. 3 (B)). In one case a figure of over 70 per cent. was reached with the onset of a pleural effusion, but the patient left the sanatorium with a normal sedimentation rate. The average fall in the sedimentation rate of the 20 pneumothorax patients who have been induced and left the sanatorium during the period under consideration is from 31 per cent. to 14 per cent., a very satisfactory drop when it is realised that the majority of these cases were tried first on routine treatment without success.

Sanocrysin has been given to 11 patients who, after improving, have hung fire and whose sputum has remained "T.B. positive" in spite of at least four months' treatment. As in pneumothorax patients, the initial change in the sedimentation rate is a definite rise followed, in satisfactory cases, by a fall. The average fall of sedimentation rate in the cases treated was from 20 per cent. to 10 per cent., figures which should be compared with those for Group B, since the patients seemed likely to remain in this category without special treatment. In six of the 11 cases the sputum became "T.B. negative" and remained so for a month before discharge, during which time three examinations were made, while in several other patients improvement was obtained.

Cases under light treatment were also closely followed for a time, but no conclusive results have been obtained.

Conclusions.

The simplified technique used in this investigation renders the test a simple and convenient aid in the summation of the individual case. The fallacies of the test as a diagnostic measure have been shown, but the prognostic significance of both the initial figure and its subsequent fluctuations is equally clear. Experience over the past two years has shown us the wisdom of a guarded prognosis in a pulmonary (not pleural) case, otherwise encouraging but with a high initial sedimentation rate—over 30 per cent.; nearly half these cases do not respond satisfactorily without special treatment. On the other hand, cases with a sedimentation rate of under 30 per cent. have a much more favourable outlook, and this appears to be independent of the initial presence or absence of bacilli in the sputum. The close relationship of the curves A and D in Fig. 2 is very striking. The changes in sedimentation rate during the first three months in the sanatorium indicate not only whether or not the patient is responding to treatment, but the rate at which this improvement is taking place and therefore the ultimate chance of recovery in the sanatorium. The figure obtained after four to five weeks' treatment is often as high as or a little higher than the initial figure; this happens repeatedly in patients whose progress is perfectly satisfactory and must therefore be discounted, but after this a rising sedimentation rate means lack of response and suggests the advisability of considering further treatment.

During pneumothorax treatment, after hæmoptysis, when giving gold, and in the initial stages of exercise, the sedimentation rate can be used to follow the progress minutely, and often indicates the onset of complications before these are otherwise apparent.

If the significance of its changes and their degree in the individual case can be accurately gauged, it appears to us that the test is of outstanding assistance to the clinician in his most difficult tasks—the evaluation of treatment and the formulation of prognosis.

Clinical and Laboratory Notes.

A CASE OF DISSECTING ANEURYSM OF THE AORTA.

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The following case seems worth recording on account of the rarity of the condition and of the difficulty in making a diagnosis.

A clerk, aged 32, was admitted to St. Thomas's Hospital on July 26th, 1928, complaining of difficulty in swallowing. He had been through the late war, but was never wounded and had never sustained any serious injury. He had, however, had cerebro-spinal fever in 1916, nephritis in 1917, and pneumonia in 1919. About June, 1925, he began to suffer from "indigestion," consisting chiefly of epigastric pain two hours after food. The pain was sometimes "stabbing," and was felt in the lower part of the chest, more on the left side than the right. Operation for presumed gastric ulcer was undertaken at Woking Hospital in November, 1927. The patient, however, collapsed under the anæsthetic, and the abdomen was closed without investigating its contents. About the time of this operation he commenced to have some difficulty in swallowing; this persisted, and since the middle of June, 1928, he had become rapidly worse.

On admission to St. Thomas's Hospital no solid food could be swallowed, being returned at once unchanged. Some pain in the upper right chest was complained of. In appearance he was pale and thin, and looked ill. There was an area of dullness to percussion and absent breath sounds over the left base behind; the air entry over the whole of the left lung was diminished. The second aortic sound was much accentuated; the blood pressure was 135/85. There was a paramedian scar in the upper abdomen; no abnormal physical signs were discovered in the abdomen or in the nervous system. There was some pyrexia, ranging up to 101° F. Screen and film examinations with X rays showed a shadow passing out from the mediastinal shadow into the left lung area at the level of the bodies of the fourth to eighth dorsal vertebræ. No pulsation could be seen in the shadow. On swallowing opaque fluid it was seen that the œsophagus was displaced forwards and to the left, being stretched over the tumour and thereby partially obstructed.

The blood showed a leucocytosis of 17,200, polymorphs being 75 per cent. A Wassermann reaction was negative.

The Operation.

The diagnosis of aneurysm appeared very unlikely and exploration was decided upon, with a provisional diagnosis of mediastinal abscess, or possibly neoplasm. On August 1st, under intra-tracheal ether, the tumour was approached by a left posterior costo-transversectomy, removing the posterior two inches of the fifth, sixth, and seventh ribs, together with the corresponding vertebral transverse processes. The exposed parietal pleura was found to be pressed back by a firm hard mass in which no pulsation could be detected. Aspiration of this mass through the pleura withdrew no fluid. The posterior reflection of the pleura was gently separated from the sides of the vertebral bodies, where the exploring finger dropped into a large cavity. On withdrawing the finger there was a big gush of blood under considerable pressure, but hardly the pressure that would have been expected in an aneurysmal cavity communicating directly with the aorta. The colour, too, was a little less bright than that of the normal arterial blood. The hæmorrhage was arrested with gauze plugging, and the wound sutured without much blood having been lost.

The patient was nursed flat on his back, and kept well under morphia for the first 24 hours after operation. On August 3rd there was very little oozing from the wound, and the patient was comfortable and said that he could swallow better than before operation. On August 4th the wound was reopened under ether, it being hoped to replace the gauze plug with a muscle-graft sutured in position; but this proved impracticable as hæmorrhage became uncontrollable as soon as the gauze plug was disturbed. The tumour was again aspirated through the pleura; this time the syringe rapidly filled with blood, the piston being pushed forcibly back by the pressure. Hæmorrhage was again arrested by plugging and the wound partially closed. On August 6th he was able to swallow and his general condition was fair, but he complained of some pain. No blood was coming from the wound. On the 7th he twice vomited a little blood and became rapidly weaker; he died on the 8th.

Post-mortem Examination.

On reopening the operation wound little hæmorrhage was found. The floor of the cavity thus exposed showed a mass of laminated clot, bounded on the left by the pleura and on the right by the thoracic vertebræ, to which the clot was firmly adherent. No destruction of bone was found.

On exploring the body from the front a dissecting aneurysm was found, extending from the arch to the bifurcation of the aorta, and giving the appearance of a double aorta. The total length of the sac was 29 cm., its largest diameter was 5 cm., near its upper end, whence it tapered to 3 cm. at the diaphragm, and 1½ cm. at the lower end. The aorta was almost surrounded by the sac. In the middle of the thorax the sac had expanded into the cavity already described, limited by the vertebræ and pleura, and lined by laminated clot, some old, some recent. The thoracic part of the sac contained a considerable amount of old laminated clot and a small quantity of fluid blood, the abdominal part of the sac contained very little clot.

On slitting the aorta the intima was quite smooth and showed no evidence of disease. At the junction of the arch and descending aorta was a sharply raised ridge crossing the vessel transversely for a length of 1 cm. This ridge presented a sharp edge quite firm to the touch and suggested a fibrous scar. The lining of the sac, when stripped of its clot, showed a somewhat irregular yet smooth surface. 4 cm. below the diaphragm was a circular orifice 3 mm.

in diameter, with smooth rounded edges, connecting the aorta with the sac. The left bronchus was compressed and considerably narrowed by the sac; the lower lobe of the left lung showed deposits of fibrinous pleurisy, patches of broncho-pneumonia, and considerable areas of collapse. At the level of the crossing of the left bronchus there were two small perforations of the sac into the œsophagus, from which blood was oozing. The lower part of the œsophagus, the stomach, and the upper part of the small intestine contained several pints of fluid blood; death was due to this hæmorrhage. The heart was normal and no arterial disease was found elsewhere.

Microscopical Examination.—The ridge in the aortic arch showed a sharply defined fibrous scar extending through all the coats of the vessel; in the deeper part a collection of calcareous granules was present; beyond the scar tissue the aortic wall was normal. A section taken just above the bifurcation showed a healthy aortic wall stripped of its adventitia, which thickened and fibrous formed the wall of the sac. The sac was lined by a new intima.

It is suggested that the aneurysm started through a linear tear in the aortic wall at the junction of the arch and the descending aorta, which subsequently healed; and that communication between the aorta and the sac had been maintained through the round orifice below the diaphragm. The origin of this second opening is not clear, nor is any suggestion offered to account for the original cause of the lesion in the aorta.

We are indebted to Mr. Cyril Nitch for permission to operate upon and publish this case.

A CASE OF RUPTURE OF THE UTERUS.*

BY E. A. GERRARD, M.B. MANCH., M.R.C.S. ENG.,
RESIDENT OBSTETRIC SURGEON, ST. MARY'S HOSPITALS, MANCHESTER.

THE following case has some interesting features:—

The patient, a woman aged 34, who had had two children previously, was admitted to St. Mary's Hospital, Manchester, after the first of twins had been delivered by natural forces. The second twin was impacted, the hand and cord being prolapsed. Attempts at delivery by version had been made without success.

On admission the patient was in good condition with a pulse of 102. On abdominal examination the most obvious feature was the prominence of a fœtal limb to the left of the umbilicus. This was easily identified as a leg and the possibility of rupture of the uterus was discussed, but was ruled out owing to the excellence of the patient's general condition, the suggestion being made that the uterine wall was extremely thin from distension by twins and hydramnios. The pelvic measurements were normal. Vaginal examination revealed a prolapsed hand and foot and an umbilical cord which was not pulsating. There was no bleeding.

Under anæsthesia, delivery of the child was effected without difficulty by traction on the presenting foot. There being no abnormal amount of bleeding after this manœuvre, the patient was left to deliver the placenta herself. On palpation of the uterus abdominally a rather puzzling state of affairs was found. The impression gained was that the placenta had left it, but downward pressure failed to push it out from the vagina, and on drawing the uterus upwards the cord shortened. It was therefore presumed that the placenta was still in utero. After an hour's time there was no sign of the placenta, the patient's condition was not too good, but there was no cause for alarm. After two hours she was beginning to show signs of shock, and as there had been a little bleeding, a further anæsthetic was given to allow manual removal to be performed.

On introducing the hand into the uterus no placenta could be found, and one became aware of a large rupture of the anterior wall of the lower segment. The cord was therefore cut off short, the vagina carefully swabbed out with antiseptics and packed with sterile gauze, and the patient, who was by now in rather a critical state, was removed to the theatre.

On opening the abdomen the missing placenta was found in the region of the spleen. There appeared to be quite a negligible quantity of blood in the abdominal cavity, less than an ounce in fact, and there was no bleeding from the torn uterus which was well contracted, but it was deemed advisable to perform hysterectomy. This was done rapidly by the ordinary subtotal technique, except that an opening was left in the cervix for drainage. The pelvis was peritonised, the abdomen mopped out, and the abdominal wall sutured in layers, without drainage.

Intravenous saline was given and the patient treated for shock on the usual lines, but she was placed in Fowler's position as soon as it was deemed advisable. She had a swinging temperature and some vaginal discharge for a week following operation, but the abdominal wound showed no signs of suppuration, and she was able to proceed home within three weeks.

The points of interest in this case seem to be: (1) The small amount of hæmorrhage, due presumably to the situation of the tear, and in contrast, the present writer saw a case about a month later where a woman was admitted to hospital with a breech born as far as the head which was hydrocephalic. While the instruments were being boiled the patient suddenly cried out, collapsed, and was dead within ten minutes. Post-mortem examination revealed a tear through the uterine artery. (2) The fact that one of the child's legs was probably projecting through the rupture into the abdominal cavity when the patient was admitted and would have given the diagnosis had her condition not been so good. (3) That the placenta and membranes should be delivered into the cavity of the abdomen. (4) The delayed onset of shock which did not appear until six hours after the rupture had taken place. This case is reported by courtesy of Dr. J. W. Bride.

* Communicated to the North of England Gynæcological and Obstetrical Society on Oct. 26th, 1928.

A CASE OF FAMILIAL HÆMOLYTIC ICTERO-ANÆMIA.

BY C. G. L. VAN DIJK, M.B. EDIN.,
HON. SURGEON, PRETORIA HOSPITAL;
AND
ADRIANUS PIJPER, M.D. LEIDEN,
PATHOLOGIST TO THE PRETORIA HOSPITAL.

THIS case is recorded because, as far as we know, it is the first properly observed case of this nature amongst the older white population of South Africa, and also because we want to make it more widely known that the diffraction method of measuring red cells provides an easy and reliable means not only of establishing a diagnosis, but also of tracing the hereditary character of the disease to its origin.

The patient was a girl, 23 years of age, looking well nourished and not obviously ill, apart from a definite icterus. As far back as she could remember her complexion had always been sallow. She had always been easily tired, and had never felt well. When still quite a child she had experienced attacks of pain in the upper part of the abdomen. Since then she had had several attacks of severe pain in the region of the gall-bladder. Various medical men were consulted from time to time, and she was treated for malaria, pernicious anæmia, and cholecystitis.

On the first occasion that she consulted us she had been to a dance, and on her arrival at home had been seized with acute pain over the gall-bladder. The attack was typical of gall-stone colic. During the next few days she had several attacks, and we found great tenderness over the gall-bladder, which could not be felt. The liver was not obviously enlarged, but the spleen was greatly enlarged, extending to the right almost to the middle line and downwards almost to the left iliac crest. The surface was smooth. There was nothing in the family history to suggest familial hæmolytic jaundice. Examination of a blood-smear, in order to settle the question of Addisonian (pernicious) anæmia by means of the diffraction micrometer, revealed a marked microcytosis. With the present instrument the diameter of the red cells in normal persons is found to be 7·3 microns, with individual variations, which, however, do not exceed 0·4 micron. The patient's red cells measured 6·4 microns. This at once established the diagnosis of hæmolytic jaundice, and a complete blood examination showed: hæmoglobin, 52 per cent.; red cells, 3,500,000; reticulocytes, 14·5 per cent.; hæmolysis, beginning at 0·7 per cent. and complete at 0·4 per cent.; van den Bergh's test direct negative, indirect positive; polymorphonuclear leucocytes, 72 per cent.; small lymphocytes, 22 per cent.; large mononuclear leucocytes, 5 per cent.; eosinophils, 1 per cent.; Wassermann reaction negative. This constituted a perfectly typical picture.

Splenectomy was performed a few days later. The abdomen was opened under local anæsthesia, and the patient was then put under light general anæsthesia. The incision was made half an inch to the left of the mid-line. A few adhesions on the posterior surface of the spleen were freed. The pedicle presented no great difficulty, and the spleen was removed in the usual way. Three accessory spleens were found and were also removed. The gall-bladder was found to contain a large number of stones. Cholecystotomy was performed, and the stones (30 to 40 in number) removed. The gall-bladder was closed without drainage. The stones ranged in size from that of a small pea to a pigeon's egg, one of the larger stones being found in the common duct. Cholecystectomy was decided against, as the patient's condition on the table at this stage was not satisfactory. The abdomen was closed without a drain, and the wound healed by first intention.

The spleen weighed 881 g., the accessory spleens together weighed 5 g. They were all dark purple and extremely congested, the cut surface was deep red, and the Malpighian corpuscles sparse and indistinct. The accessory spleens showed all the changes present in the large spleen, but to a lesser degree. The trabeculæ were not conspicuous, and the arteries often showed thickened dense white walls. Microscopically the pulp was filled with blood, and the lymph follicles were spare and often without germ-centres. The reticulum was scanty, and the sinuses relatively empty and collapsed and lined with the peculiar endothelial cells described by Meulengracht, containing large, round, prominent nuclei and standing packed side by side. Pigment was distributed throughout all the elements of the spleen. That part of it which gives an iron reaction was found in sinuses, in pulp-cells, and in the intima of many arteries. In the sinuses it showed a honeycomb appearance, as if the spaces between a number of blood-cells had been stained and the cells themselves had disappeared. In the pulp the pigment was diffused through the whole protoplasm. The largest amount of iron pigment was in the arterial walls, and it was present in many elastic tissue strands.

A week after the splenectomy the hæmoglobin had risen to 85 per cent. and the red cells to 4,500,000, but there were still 14 per cent. reticulocytes; van den Bergh's test was still indirectly positive, and the diameter of the red cells had increased to 6·6 microns. Sixteen days after the operation the hæmoglobin reached 98 per cent., the red cells remaining at 4,500,000, whilst the reticulocytes had come down to 7 per cent. The van den Bergh's test was then negative, and the red cells showed a further increase in diameter, measuring 6·7 microns. A final examination was made one month after the operation. The hæmoglobin was then 100 per cent., the red cells 5,360,000, with 9 per cent. reticulocytes, van den Bergh's test giving a faint indirect positive. Hæmolysis started at 0·46 per cent. saline, and was complete at 0·3 per cent. saline. The red cells again measured 6·7 microns. Clinically the patient was perfectly well and very pleased with what had been done. It is, of course, well known that splenectomy in these cases has a marked beneficial and lasting effect, but that it does not altogether abolish the objective signs of the disease.

The familial nature of the disease in this case could be investigated through the active coöperation of the family physician, Dr. I. Rosenberg, who kindly prepared blood smears of the nearest relatives. Upon measuring their blood-cells by means of the diffraction micrometer it was found that the mother of the patient showed the quite normal diameter of 7·3 microns. The father's cells, however, measured 6·6 microns, one brother's 6·8 microns, another brother's 6·7 microns, a sister's 6·8 microns, and a paternal uncle's 6·9 microns. An inquiry into the medical history of the relatives on both sides, undertaken by Dr. Rosenberg, was quite negative, except in the case of the father. His history mentioned an attack of "inflammation of the liver," and later an attack of jaundice, supposed to have been "catarrhal."

Without going into the controversy about the relationship between microcytosis and the pathology of the disease called familial hæmolytic icterus, it seems quite obvious to us that our case contained a hereditary element, and that this was inherited through the father, and was present in the father's blood relations and absent in the mother, and that the presence of this hereditary character expresses itself in the average diameter of the red blood-cells, as measured by the diffraction micrometer.

References.—Meulengracht, E.: Der chronische hereditäre hämolytische Ikterus, Leipzig, 1922. Pijper, A.: THE LANCET, 1924, ii., 367.

Medical Societies.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

AN EXPERIMENTAL STUDY OF YELLOW FEVER.

Prof. EDWARD HINDLE, Sc.D., the Beit Fellow in Tropical Medicine, gave a lecture to this Society on Jan. 17th, describing his recent work on yellow fever in monkeys, with special reference to the method of vaccination discovered by him, and to other aspects of prophylaxis.

He began with a brief account of the present distribution of yellow fever, drawing attention to the fact that West Africa is now the main endemic centre of the disease. After referring to the discovery by Stokes, Bauer, and Hudson that Asiatic monkeys, and especially *Macacus rhesus*, could easily be infected, he described the way in which he succeeded in getting the virus of the disease brought back to London by Dr. Andrew Sellards. With the liver of an infected monkey that had been kept frozen during the voyage from Senegal to London, a period of 12 days, the disease was reproduced in this country, in a rhesus monkey, at the end of March, 1928. Since that date the strain had been maintained at the Wellcome Bureau of Scientific Research and had been the subject of the experiments and observations to be described. This strain of yellow fever had been isolated from a Syrian at Dakar, who suffered from a very mild attack, yet in monkeys the disease had shown a very high degree of virulence, the animals almost invariably succumbing to the infection. As a general rule transmission from one monkey to another was effected by the subcutaneous inoculation of a small quantity of infected liver, ground up in normal saline. In a series of 50 monkeys inoculated with fresh virus there was not a single recovery, except when sublethal doses were employed. The liver, spleen, and kidney of monkeys dying of the disease were found to contain variable amounts of virus, ranging from 1000 to 100,000 minimum lethal doses per gramme. The inoculation of 0·0001 g. of infected tissue was usually as effective as 1–2 g. in producing the disease, but when doses of 0·00001 g. were employed the incubation period was lengthened. In two instances the inoculation of this dose caused no rise in temperature nor any other signs of infection, yet the animals were found to have been immunised, and subsequent inoculations of very large quantities of virus had no effect.

In monkeys an incubation period, usually of three days, was followed by a rise in temperature of about 2° F., which lasted for 36 to 48 hours, succeeded by a sudden drop to subnormal, and the death of the animal about five days after being inoculated. The symptoms in monkeys dead of the disease, with the exception of minor differences, resembled those in human patients.

It was found that the frozen virus preserved its virulence for about 18 days, after which period it acted as a vaccine. Thus animals inoculated with the liver of infected monkeys, kept frozen for one to three months, showed no sign of infection but were immune against subsequent inoculations of fresh virus. Similarly, it was found that the virus could be dried in vacuo, and, if kept absolutely dry, preserved its virulence for at least four months, and probably longer. If, however, this dried virus was exposed to moist air, it gradually lost its virulence and could then act as a vaccine.

Mosquito Transmission.

Prof. Hindle described his technique of handling infected mosquitoes and then gave the results of his transmission experiments in this country with both

an African and Indian race of *Aëdes aegypti* (*Stegomyia fasciata*). The disease, he said, was readily transmitted to monkeys by the bites of mosquitoes that had fed on an infected monkey at least nine days previously. Both races of mosquitoes could carry the infection, but there was a suggestion that the Indian race was a little less susceptible than the African one. In addition, experiments were described showing that insects might harbour the virus without producing infection by their bite. This was the first proof that the Indian race of *Aëdes* is capable of transmitting yellow fever, and now there could not be any doubt that if by any ill chance the disease ever reached the Orient, the local race of mosquitoes could serve as an efficient carrier. The stringent quarantine regulations concerning this disease were fully justified by the results of these experiments.

Immunity.

It had been known from early times in the history of the disease, Prof. Hindle continued, that an attack was followed by a high degree of immunity, and the serum of convalescent patients, if inoculated into monkeys, would protect them against infection for about one month. The presence of active immune bodies in the blood of recovered patients furnished a means of finding out whether a person had had the disease, for it was only necessary to inoculate a rhesus monkey with the serum of a suspected convalescent case and at the same time with yellow fever virus. By this means in West Africa the Rockefeller Commission had detected the existence of yellow fever in villages where no obvious signs of the disease were present.

Employing these methods the nature of two atypical cases of yellow fever contracted in the laboratory had been discovered. In both patients (the lecturer and his laboratory attendant) the symptoms, a sharp fever of short duration, had closely simulated and at the time were attributed to influenza. After the fever, however, in both cases the blood contained immune bodies against yellow fever, as tested by inoculation into monkeys, and therefore there could be no doubt about the nature of the attacks. It might be added that jaundice and albuminuria, although looked for, were not detected, and the only characteristic symptom was hyperæsthesia of various parts of the body in one patient, which persisted for three to four weeks. These results, combined with the production of immunity by the inoculation of sub-lethal doses of virus, furnished additional evidence in support of the view that mild cases of yellow fever might occur which presented none of the ordinary symptoms of the disease. These cases would never be recognised in the ordinary course of events, but would be capable of infecting mosquitoes that fed on them and thus maintaining the infection in a latent or hidden form.

It was an interesting example of tissue immunity, said Prof. Hindle, that the liver and spleen of monkeys that had recovered from yellow fever, when inoculated into normal monkeys in 1·0 g. doses, was found to immunise them against subsequent inoculations of fresh virus. The brain, kidney, and lymphatic glands of convalescent monkeys did not possess this property.

The inoculation of hyperimmune serum into infected monkeys, after the commencement of fever, was found to have no obvious effect on the course of the infection and consequently doubt was expressed as to the value of serum treatment in human cases of yellow fever. Hyperimmunised monkeys, when inoculated with large doses of infected liver, were found to succumb within 48 hours to a peculiar type of anaphylaxis. Ordinary immunised monkeys were unaffected by the inoculation of similar doses.

Vaccination.

Great hopes had been placed on Noguchi's vaccine prepared from *Leptospira icteroides*, supposed by him to be the causative organism of yellow fever. It was now known that this organism was identical with that of Weil's disease (spirochætosis icterohæmorrhagica), therefore the vaccine prepared from it could have no value in yellow fever prophylaxis and its use had now been abandoned. The re-establishment of the earlier view that this disease is caused by a filterable virus had led Prof. Hindle to apply the methods of vaccination which had proved successful in the production of vaccines against such diseases as fowl plague and dog distemper. In June, 1928, he showed [1] that a phenol glycerine emulsion of the liver and spleen of infected monkeys conferred a high degree of protection against very large amounts (10,000 to 100,000 lethal doses) of the virus. A formalinised suspension had the same vaccinating property. During the past six months these experiments have been extended, the earlier phenol glycerine vaccine being replaced by a formalinised one, as the injection of glycerine was painful. The present method of preparing the vaccine was as follows:—

The liver and spleen are removed from an infected monkey killed in the last stage of the disease, when the temperature has become subnormal. These organs are weighed and ground up in a mortar with fine sand. A measured quantity of 9 per cent. salt solution, equal to half the original weight of these tissues, is added and the mixture allowed to stand for a few hours. Then distilled water is added, equal to nine times the volume of the strong salt solution. As a result all the cells are cytolised, liberating the contained virus, and a 20 per cent. suspension of tissue extract in normal saline is obtained. This suspension is allowed to sediment, then filtered through muslin. Part of it is tested for virus content, and a 1 in 10,000 dilution of the original tissues should produce a fatal infection in a monkey.

The virus suspension is killed by the addition of 2 per 1000 formaldehyde and after 24 hours can be used as a vaccine, if it passes the usual sterility tests.

Aragão adds 0·5 per cent. phenol to this suspension, in addition to the formaldehyde. Both phenol glycerine and formalinised vaccines, when kept in the ice-chest, have been found to preserve their properties for some months. The first has also been dried in vacuo and found to retain its properties.

Monkeys inoculated with these vaccines developed a high degree of protection against yellow fever, and this protection had been tested against the inoculation of fresh virus and the bites of infected mosquitoes up to four and a half months after vaccination, without showing any signs of diminution. In most cases, about ten days after being vaccinated, the monkeys were inoculated with 0·1 g. infected liver material, equivalent to 1000 to 10,000 lethal doses, and in some instances with very much greater quantities of virus. The results of the first series of experiments which were given in detail suggested that when the amount of virus in the infected monkey falls below 10,000 minimum lethal doses per gramme, any vaccine made from its tissues gives only partial protection. With tested vaccines a very high degree of protection was obtained, and this in spite of the fact that enormous doses of virus were used to test the vaccinated animals, *equivalent to at least 1000 times the dose which invariably produced fatal infections in normal animals.* In addition the severity of the tests was enhanced by the short interval between vaccination and inoculation which was hardly sufficient to allow the full development of protection.

The lecturer's results had been confirmed, he said, by A. Pettit and his collaborators working in Paris, and by H. de B. Aragão in Rio de Janeiro, who used a Brazilian strain of yellow fever. Aragão obtained constant protection in monkeys, and therefore tested the vaccine in human beings, using a 20 per cent. suspension of liver, spleen, brain, and kidney containing 2 per 1000 formaldehyde and 0·5 per cent. phenol. This vaccine was administered subcutaneously in 2 c.cm. doses to the laboratory workers at the Institute Oswaldo Cruz, with no ill-effects, and subsequently used in a small epidemic of yellow fever. Between 300 and 400 people were vaccinated, including the health officers working in the infected neighbourhoods, and people living either in the same house or in the vicinity of yellow fever cases.

[1] Brit. Med. Jour., 1928, i., 976.

Although no unwarranted conclusions had been drawn it was noted that none of the vaccinated contracted the disease, although some of them must have been exposed to infection. These results were considered so favourable, that the vaccine was now being prepared on a larger scale for use by the Public Health Department of Brazil.

With regard to the position in West Africa it was pointed out that there is an urgent necessity for some additional method of protection against yellow fever, as evidenced by the number of past epidemics, and at present there seemed to be no likelihood of anti-mosquito campaigns succeeding in eradicating all chance of infection. Accordingly, the Colonial Office had decided to give Prof. Hindle's yellow fever vaccine a trial in the West African Colonies, and had invited the Wellcome Physiological Research Laboratories to undertake its production on a large scale.

In conclusion, the lecturer expressed his opinion that by the general use of this vaccine, of proved efficiency in monkeys, there was every hope of yellow fever ceasing to be a source of danger in the world.

Sir JAMES KINGSTON FOWLER, in proposing a vote of thanks to Prof. Hindle, called attention to the work of the West African Yellow Fever Commission of the Colonial Office (1913–15), and pointed out that many of the views expressed in their reports had proved a foundation for subsequent work on the disease.

ROYAL SOCIETY OF MEDICINE.

SECTIONS OF PATHOLOGY, SURGERY, AND GYNÆCOLOGY.

A COMBINED meeting of these Sections was held on Jan. 18th with Dr. J. S. FAIRBAIRN, President of the Section of Gynæcology, in the chair, to discuss

POST-OPERATIVE THROMBOSIS.

Dr. W. HOWEL EVANS, in opening the discussion, said the problem of thrombosis was many sided, and a question which had always interested the clinician and the pathologist, in trying to account for post-operative thrombosis, was whether there was any evidence of alterations in the blood which might promote coagulation, and if so, what their importance was in relation to other factors. There was now evidence that some of the factors concerned in coagulation might be disturbed. Dr. Howel Evans wished to extend the consideration to thrombosis occurring after parturition, after fractures, and after acute fevers, such as pneumonia. All these forms presented points of similarity. All were associated with tissue injury and the subsequent absorption of breakdown products; in all there was imposed on the patient a period of enforced restraint or immobility; in all the thrombosis, with or without embolism, occurred some days after the original trauma. And running through all was an increase of the blood-platelets, whilst in some at least there was evidence of an increase of fibrinogen in the blood.

It had long been known that tissue juices contained a thromboplastic material or thrombokinase, which was able to produce coagulation. This it could do by the activation of a mother-substance, prothrombin, in the presence of calcium-ions, in this way forming thrombin, which clotted fibrinogen. Also something in the injured tissue had the power to provoke an increase in platelets and fibrinogen, though the nature and mechanism of those substances seemed at present obscure. It was now clear, too, that conversion of fibrinogen to fibrin was a central feature of the process of coagulation. Blood fibrinogen was also increased during pregnancy. The blood-platelet was a definite kind of cell, arising in the bone-marrow, which was destroyed by the reticulo-endothelial system. By their disintegration these platelets provided material which was intimately associated with the formation of thrombin and the coagulation of fibrinogen. If when blood was shed these platelets were prevented from disintegrating or were filtered off, the blood showed no tendency to spontaneous coagulation. In static thrombi the first step in the building of the thrombus was the adhesion of platelets to the vessel wall, followed later by the formation of fibrin. This adhesion to the wall might be helped by a slowing of the circulation. There was a parallelism between the number of circulating platelets and the tendency to coagulation in the various diseases.

The speaker, with his colleagues, had studied 50 cases following operation, these ranging from minor to large abdominal operations. Before the operation, in most, the platelet count was about the normal, but four to six days after operation it rose, reaching its maximum at about the tenth day, and normal was reached in another ten days. In many cases having a major operation the increase was 100 per cent. to 150 per cent. The age of the patient did not affect the increase, neither did exercise, massage, or movement following the operation. A study of 28 cases following parturition gave a similar result, and the results were most striking following Cæsarean section, as after this operation the platelets rose more quickly, and gave an average increase of 200 per cent., the maximum being reached in ten days. The return to normal was slower than after the other operations. In 11 cases of simple fracture, mostly of the lower limbs, with confinement to bed, a similar curve was seen. A similar observation was made in the case of fevers. From control observations it was evident that the platelet reaction occurred independently of simple loss of blood, anæsthesia, and rest in bed. In sepsis the platelets varied irregularly. The evidence supported the use of post-operative exercises, and Dr. Howel Evans suggested that search might be made for some anti-coagulent substance or drug which would hinder the lysis or reduce the agglutinability of the platelets.

Mr. D. H. PATEY said that four manifestations of post-operative thrombosis were met with—namely, localised thrombosis, massive pulmonary embolism, minor pulmonary embolism, and latent thrombosis. The first two of these were most easily studied and most readily diagnosed. He did not think the tissue juice absorption theory of causation could be supported on the evidence. Neither did he consider that the sitting-up position of the patient after operation was a factor in localising the thrombotic process. One surgeon who, after operation, kept all his patients flat on the back experienced no less a tendency for them to develop thrombosis and embolism. Mr. Patey considered that Dr. Howel Evans's work on the blood-platelets marked a definite advance in knowledge on this subject. But in order to put this theory on a firm basis it would be necessary to furnish unequivocal proof that after splenectomy—the operation after which the rise in the platelets was most marked—there was special liability to thrombosis and embolism. It was a phase of the subject which might well be looked into. Mr. Patey thought that the stasis aspect of the subject—the only one which could in any degree be controlled—offered the most hopeful side for attack. Not only was the inhibition of the diaphragm an important matter, but the question of the effect of the incision on the muscular abdominal wall was equally so. Skiagrams which the speaker exhibited showed distinct inhibition of the diaphragm due to pain, and he said there was no way of getting over that inhibition due to pain, though deep-breathing exercises did much to induce movement in a sluggish diaphragm. Any good effect produced by morphia was spoilt by the lack of tone it caused in muscle. He thought too much attention had been concentrated on the diaphragm in these cases and too little on the abdominal muscle. The effect of the operation on the abdominal wall was two-fold; its tone was diminished, so that it gave a less effective response, and its response was irregular. Much could be done by proper abdominal massage to send the abdominal wall to the diaphragm. In conclusion, Mr. Patey said he felt the

profession was now definitely advancing towards the elucidation of this problem, and that Dr. Howel Evans's work on the blood-platelets was a very pronounced contribution; the actual solution, he felt, would come from the laboratory. Important additions to knowledge on it would, however, arise from old and well-thought-out clinical methods and experiments accurately recorded.

Mr. VICTOR BONNEY first commented on the discordance between clinical facts at the present time and the consequent confusion in which the subject was shrouded. The process might be either bacterial, toxæmic, or hæmic, the latter implying some alteration in the blood itself. In favour of the bacterial idea was the fact that a thrombosis which was obvious, either by the clot being palpable or by visible signs of venous blockage, was always preceded by fever and local pain and other signs of inflammation. On the other hand, cases of pulmonary embolism did not usually exhibit these symptoms before embolism, though there was pain and fever afterwards. Thrombosis, if bacterial, bore no relation to the degree of septicity in the operation area, being, indeed, commoner after so-called "clean" operations than after those in which there was much suppuration. Thrombosis after labour was not usually accompanied by symptoms of typical puerperal fever, but occurred independently in the second or third week, as though it were an entity in itself. The toxic idea Mr. Bonney thought unlikely. Post-operative thrombosis was almost entirely limited to the veins of the lower half of the body, chiefly the legs, and of the legs usually the left one. Toxæmic lesions were generalised, not picking out any region. With regard to the hæmic view, Mr. Bonney pointed out that in hæmophilia lesions were generalised. Thrombosis was rare after operations on the uterus via the vagina, and this seemed to suggest that trauma to the uterus did not suffice to cause thrombosis unless trauma was also caused to the peritoneum. The occurrence of thrombosis after parturition was, however, against this. The symptoms appeared at a significant period—i.e., from the tenth day onwards—whilst in ordinary infection the symptoms appeared in two or three days. Therefore the causal organism in thrombosis did not belong to the group of ordinary septic organisms, the incubation period of which was short. Possibly, he suggested, post-operative thrombosis was due to anaerobic spore infection from the patient's own bowel. Catgut blisters he thought were due to the growth of certain anaerobic sporing organisms in the catgut, and if that were so, they were derived from the animals from which the gut was taken. *Bacillus coli* appeared in the urine after all abdominal sections. Mr. Bonney felt that the research of Dr. Howel Evans was very hopeful.

Discussion.

Mr. J. P. LOCKHART-MUMMERY considered that the problem of post-operative thrombosis was almost entirely a physiological one, and it was not likely to be solved until much more was known about intravascular clotting, a subject as yet only partially understood. This thrombosis admittedly occurred far oftener after abdominal operations than after any others, and he thought it was rightly assumed to be due to interference with movements of the abdominal wall. Even after labour there was a badly stretched abdominal wall which did not afterwards contract properly. It was also agreed that the common time for the occurrence of post-operative infarct was about the tenth day. He believed that the thrombosis in the vein occurred at, or immediately after, the operation, and that the reason of the symptoms at the tenth day was the softening and movement of the clot. Sepsis as a cause need not be seriously discussed. A hundred years ago John Hunter had found that if the jugular vein of a normal horse were tied in two places intravascular clotting did not take place. If at the end of a fortnight that vein were opened which had been tied off, the blood was still fluid, so that mere stasis did not cause clotting. If blood were withdrawn from a vein without the needle having touched its wall in any way save at the point of puncture, the blood so withdrawn could be kept in the laboratory for three weeks without clotting, though in that time it might decompose. If, however, even the slightest trace of thrombokinase were added to the withdrawn blood it immediately clotted. There was no means of preventing thrombokinase getting to the blood when patients were cut, but to some extent stasis in the veins could be prevented. A tight packing of the abdomen after the operation would tend to hold it so steady that the diaphragm would have a better chance of action without causing great pain.

Prof. TOM HARE (who had worked in association with Prof. E. E. Glynn) gave some results of an inquiry into the ætiology of lamb dysentery, which bore some resemblance to melæna neonatorum in human babies. The blood of 11 healthy ewes was examined and the initial counts were made within 5 to 15 days before parturition, the latter process having been, in all, natural and unassisted. One post-partum count was made in each case. He exhibited a table showing that the findings as to the rise in the platelets after parturition agreed with those of Dr. Howel Evans.

Dr. F. J. MCCANN said that much could be done clinically to prevent post-operative thrombosis. In the vast majority of cases he thought the cause of the condition was the surgeon at the operation, either in that he was guilty of errors of technique during the operation or in mistakes made in after-treatment. Efforts should be made to diminish the pain in the abdominal wall. A stitch tied very tightly caused agony until it had cut its way out, and such intense pain had a great influence on the diaphragmatic contraction. If the stitching of the abdominal wall was done without constriction, the surfaces being no more than opposed, little pain after operation would ensue, and Nature's glue would do the rest. Thick material should not be used for sutures. And in the after-treatment a very important matter was movement from the first and allowing patients to lie in any posture they found comfortable. The knee-pillow should be abandoned; it was an important disposer to stasis in the femoral vein. Dr. McCann had not had a case of pulmonary embolism in his 25 years of practice.

Mr. D. LEVI said that in the blood there were thrombin substances which made the blood clot, also heparin which stopped clotting, the latter having been discovered in America. This was very potent, 0·1 g. sufficing to stop coagulation in 40 c.cm. of blood, while 0·1 g. per kg. of animal weight stopped coagulation in an intact animal. It could be sterilised by boiling, and was capable of being injected intravascularly without producing untoward effects.

Mr. CECIL ROWNTREE said all practical surgeons would congratulate Dr. McCann on the success which had attended his surgical endeavours, though the procedures he carried out were used by others whose work was not free from these accidents. It seemed to him there was a danger in this discussion of trying to make the facts fit in with the preconceived hypotheses. The thrombosis under discussion did not always follow operations. He had hoped Mr. Bonney would have given the percentage incidence of the complication after normal labour, when it did sometimes occur. Sometimes a patient died from the accident on the third day. If a patient of his got an obvious femoral thrombosis he, the speaker, felt happy, because he knew that patient would not get a pulmonary embolus. He did not think embolism had any relation to sepsis as ordinarily understood. A friend suggested to him 18 months ago that the administration of large doses of alkali after an operation might so alter the hydrogen-ion concentration as to increase the clotting time, and so avoid thrombosis. It was yet too soon to pronounce on that.

Dr. W. CRAMER pointed out that in the discussion no distinction was made between intravascular

clotting and thrombosis. In both the ultimate result was the same, but intravascular clotting produced by the injection of tissue extracts was a process which took place in a few seconds, whereas thrombosis as clinically seen was a slow process, whose beginning took place, as Mr. Lockhart-Mummery pointed out, at the time of operation. The microscopical structure of a clinical thrombus supported that view. He considered that a thrombus began as a mass of agglutinated platelets with practically no fibrin. Fibrin was formed when the blood-platelets disintegrated, which was different from agglutination.

Miss FRANCES IVENS expressed the hope that Dr. Howel Evans would continue his researches and include in them an investigation of the toxæmias of pregnancy. In her experience thrombosis was much more apt to occur when these toxæmias were present. Possibly substances let loose in the circulation at operation had much to do with the causation of thrombosis.

Dr. HOWEL EVANS, in a brief reply, agreed that post-operative thrombosis was a physiological result. He did not wish to give the impression that he believed that what had been found out concerning the blood-platelets explained the whole matter; but it showed a peculiar physiological response to trauma. A necessary prelude seemed to be tissue destruction and absorption of such products. There might be subtle qualitative changes in the corpuscular constituents or the plasma of which nothing was yet known. Another point was that after splenectomy for splenic anæmia mesenteric thrombosis not infrequently happened. Rosenthal had published a series of cases bearing this out.

Mr. VICTOR BONNEY also replied. He said that formerly he strapped patients rigidly after operation, but most of them would not endure it, consequently he had abandoned the practice. He agreed that it was a means of stopping post-operative distension. In answer to Mr. Rowntree's remark about normal labour, Mr. Bonney agreed that it was another disquieting fact which complicated the study of this accident. He joined with others in assessing highly the value of Dr. Howel Evans's researches, and added that he thought there must be something local which determined the onset of the thrombosis.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

AT a meeting of this Society held on Jan. 18th, with Dr. J. HOWARD-JONES, the President, in the chair, a discussion on the

INSPECTION AND REGISTRATION OF NURSING HOMES

was opened by Dr. J. J. BUCHAN, who confined his remarks to the administrative and legal aspects of the Nursing Homes Registration Act which came into force on July 1st, 1928. Considerable abuses from the hygienic, medical, and social points of view had been known, he said, to medical officers of health for some time before the Act. Complaints had reached them by circuitous routes and their society had been duly impressed, more so than had the British Medical Association and Ministry of Health. It was, in fact, the representations of the Society of Medical Officers of Health and of the College of Nursing that had led to the passing of the Act. The legislation was a first attempt, but it was so imperfect that it would require almost immediate modification to put it on a sound and practical basis. In the first place a nursing home was defined in very general terms as "any premises used or intended to be used for the reception of and the providing of nursing for persons suffering from any sickness, injury or infirmity." It excluded asylums and institutions under the Lunacy Act of 1890 and the Mental Deficiency Act of 1913, and any place under the control of government or incorporated by Royal Charter, but included all surgical, medical, and maternity homes. The definition, however, went much further than that and brought in convalescent homes, and places for the reception of aged and infirm persons. The Act tried to deal with all these varied institutions as if they were one. Section 1 (3) said that "the local supervising authority shall, on the receipt of an application for registration, register the applicant in respect of the nursing home named in the application and issue to him a certificate of registration." Thus the duty was laid on county councils and county borough councils of registering the home provided it was suitable for the purpose named in the application. There was nothing to prevent a keeper applying for registration as one kind of home, securing a certificate as suitable for that purpose, and then using his premises for another kind of home. The only appeal would be to the court of summary jurisdiction at quarter sessions, and that court would look on the legal position and not on the medical aspect of the case. Dr. Buchan had been advised that it was quite possible within the terms of the Act to use a convalescent home—registered as a "nursing home"—for maternity, and to be a "registered maternity home" without committing a punishable offence. The local authority in such a case would have no authority to cancel the registration. This was a point of real difficulty and one in which the difficulties would increase with time, and it might well do away with the good expected to result from the Maternity Homes Act of 1926. The great objection to the new Act was this way of dealing simply with a very complicated subject. If an old bedridden woman paid a neighbour 15*s*. a week to look after her, the cottage would almost become a "nursing home" under this Act. Any simple procedure such as that set forth in the Act was practically impossible; power should have been given to local authorities to differentiate between the different classes of nursing homes. To demand the presence of registered nurses for aged persons in cottages was an absurdity. The Act was peculiarly unworkable. Dr. Buchan's practice was to ask the medical officer for maternity and child welfare to carry out the inspection under the Act through her health visitors, and to ask the chief sanitary inspector to detail an inspector to look into the sanitary accommodation.

Dr. A. MIDDLETON HEWAT agreed with Dr. Buchan that there were great difficulties in working the Act, and that its wide terms led to differences in interpretation. The first difficulty that arose was presented by the word "nursing" in the definition. It was necessary to prove that nursing was provided in homes for the aged and infirm if these were to be registered, and it was not always easy to know where nursing began and ended. Abuses were often found in these places, and it was as well to include as many as possible under registration. A second difficulty was produced by the definition of a maternity home as "any premises used or intended to be used for the reception of pregnant women or of women immediately after childbirth." In London there were many homes for pregnant unmarried girls who were taken in early in pregnancy and sent elsewhere for their confinements. Under this definition these places became "nursing homes."

Grounds on which Application for Registration may be Refused.

Section 1 (3) enumerated the grounds on which a local authority might refuse to register an applicant: (*a*) "that he is not a fit person whether by reason of age or otherwise." In London it had been ruled that 21 was the minimum age, but no maximum had been fixed, and some homes had been registered where the keeper was getting on in years and it was doubtful whether he or she was fit for the work. Elderly trained nurses, too old for other work, often took in aged and chronic patients, and these institutions needed watching. (*b*) "For reasons connected with situation, construction, accommodation, staffing

or equipment," the registration might be refused. The existence of an offensive trade next door or of some special fire danger, such as a garage below, would constitute reasons connected with situation. It was the London practice to fix definitely the number and type of cases that might be accommodated in each room, not in the whole building. The space was measured and plans were drawn up by the architect. The certificate stated precisely how many cases might be admitted to each room—e.g., two surgical or medical, or one medical case only. 960 cub. ft. were allowed for mother and baby, 800 cub. ft. for a mother only, 700 cub. ft. for a surgical, medical, senile or chronic case, and 600 cub. ft. for an ante-natal case. In a few cases where the cubic capacity had fallen slightly below the standard, registration had been allowed on a satisfactory square measurement. That it was legally possible to specify the type of case was shown by the same subsection, which went on to say, "fit to be used for a nursing home of such a description as the nursing home named in the application." The classification of cases adopted was: maternity, surgical, medical, and chronic or senile. Of course, many rooms were registered for all or several types of case. There was no objection to nursing surgical cases in a maternity ward, and one bed might be used alternatively for either kind of patient, provided suitable precautions were taken if a septic case occurred. It was, however, the rule that, if a room with more than one bed were used for a maternity case, the other beds should only be used by maternity cases. Women did not like to have their babies in a mixed ward. Mental and alcoholic patients were not allowed in the same home as maternity cases. Many untrained and incompletely trained women were posing as nurses without the knowledge of their patients, and the Act had been initiated to meet this abuse more than any other. Hard-and-fast rules could not be laid down; the number of trained nurses must depend on the number and relative proportion of the cases. In an ordinary nursing home the London County Council required two day and one night nurse for every six patients and one nurse on night duty for every four patients, or for any one patient who was acutely ill. If the keeper were a midwife in practice, she had to make some arrangements for the care of her patients while she was out.

Subsection (3) (*c*, *d*) insisted that the keeper of the home should be a qualified nurse, and to this London had strictly adhered, with the one exception of the small home for senile chronic cases. These were registered if the keeper was a good type of woman and reliable, even though untrained. There was no regulation as to the proportion of qualified to unqualified on the staff, but the inspectors tried to persuade keepers to employ as many qualified nurses as possible. Particular notice was taken of the accommodation provided for the staff, both bedrooms and sitting-rooms. The equipment demanded must depend on the type of home. For the guidance of keepers a leaflet had been printed setting out a standard minimum; the floors must be covered with linoleum or polished; venetian blinds were not allowed; washable covers must be provided for upholstered furniture; each bed must have so many sheets, towels, and blankets; there must be a locked poison cupboard, and a sufficiency of such things as cans, bowls, dressings, and so on. A very important point was fire precautions. No nursing home should be registered without the coöperation of the borough surveyor. Every home in London was inspected by a member of the fire brigade and an architect. Special provision was made in Section 1 (3) (*e*) for new maternity homes; registration was to be refused if "any person employed in attending any woman in the home in childbirth or in nursing any patient in the home is not either a duly qualified medical practitioner, a certified midwife, a pupil midwife, or a qualified nurse." If, now, an old surgical home wanted to register for five maternity beds, it would become a new maternity home under this section. The provisions of the section could not be made to apply to the whole home, so a note was usually put on the certificate that no maternity case should be attended by any but the class of persons listed.

London had adopted practically unchanged the model by-laws suggested by the Ministry, but they had not yet come into operation. They imposed a great deal of clerical work on the keeper of the home. It was most important to carry out the inspection without friction or annoyance and to choose the inspectors very carefully. The London County Council employed only medical officers and sanitary inspectors, as it felt that highly trained matrons might resent inspection from less well-qualified health visitors. Section 6 gave the local authority power to exempt institutions not run for profit. In London it had been considered wiser not to exempt all that came under this proviso, but to inspect them unless their work was already well known, as in the case of the smaller hospitals. Mental cases under single care technically came under this Act, but it had been decided at a conference between the London County Council and the Board of Control that as the patients were adequately visited by the latter body, and as it would be difficult to prove that nursing was provided, these houses should not be registered as nursing homes, provided there were no other nursing activities in them. The Council insisted that an isolation room should be provided wherever two or more maternity patients were housed in one room, and matrons were asked to state what steps they would take if a septic case occurred in a surgical ward or double room. Operating theatres were not required at present.

Dr. Hewat thought it would be quite possible to refuse certification on the grounds allowed in Section 1 (3). In London a provisional registration certificate was issued after the report of the various visitors had been received by the public health committee. Subsequent inspectors reported when the requirements had been complied with, and the final certificate was then supplied. Already there had been very considerable improvement, especially in cleanliness and general orderliness.

The Matron's Point of View.

Miss M. M. WINSTANLEY emphasised the fact that nurses had wanted the Act, and that their ideals were as high as could be desired; it was from no personal hardship that she offered certain criticisms of the requirements of the London County Council. For instance, they had thought it necessary to insist on outside staircases, balconies connecting with the next house, a certain number of exits; that area doors always be kept open, windows never be barred, and panels be lined with asbestos. Balconies connecting with the next house might cause considerable unpleasantness with neighbours, and area doors opening on to mews might cause grave nuisance. Matrons found it hard to believe that houses which they had been running for 30 or 40 years had suddenly become unsafe. They would not wish to put forward any argument against the safety of their patients, but they wished to ensure at the same time the safety of the patient and the safety of those women who had struggled for years and who depended on the homes for their livelihood. There was small danger of fire in nursing homes, owing to the constant supervision. No part of a nursing home was ever left unattended for long, night or day, and patients were safer there than in their own homes. Moreover, West End nursing homes were surrounded by fire stations and the record of fires in them was almost nil. On an average two-thirds of the patients in a home at any time would be well enough to walk out, and if sufficient extinguishers were provided the fire would soon be got under control. Nowadays there were very efficient fire escapes suitable even for abdominal cases. It was difficult to see how doors were going to be a protection; they made increased work and noise and liability to accidents, and it was more difficult to move patients and to detect fire by

smell. Nor could the nurse hear at once if patients got out of bed. Unbarred windows and open doors would be a danger to patients with high temperatures, who were apt to wander about. Demands for extensive structural alterations came very hard on people with short leases; fortunes were not made out of nursing homes nowadays, and nearly all the profits went into improvements. Matrons had felt that it would be helpful if someone with experience of running a nursing home could be consulted about equipment, staff, rooms, and such matters. Some medical cases, like pneumonia and typhoid, required larger rooms than surgical ones. Nursing could be magnificent without modern appliances, and the details of the running of a home must radiate from the personality of the head and her staff.

Discussion.

Dr. GERARD TAYLOR asked what was a reasonable standard of space to demand for a children's convalescent home. Standards ranging from 45 to 77 sq. ft. had been put forward by different authorities. In Berkshire they had made it a general rule not to grant exemption to any convalescent homes; this avoided invidiousness, and was working well.

Dr. R. M. F. PICKEN said that most of the trouble was going to arise out of the by-laws. Cardiff had adopted the model supplied by the Ministry, and difficulties had been raised by consulting surgeons. The local division of the British Medical Association had asked the Headquarters Staff of the B.M.A. to see the Ministry of Health with a view to altering these regulations. They objected, for instance, to compelling the keeper to enter every payment made by or on behalf of patients, on the grounds that it was no business of the local authority if the nursing home made a private arrangement with the doctor to take a poorer patient for a reduced fee. One surgeon had objected to the matron keeping medical records and had forbidden her to keep any of his cases, on the ground that he kept them himself. In this case the surgeon was the culprit, but the matron would be the person to be punished, and she was placed in a very difficult position. Objection was also made to requiring the keeper to record payments to any medical practitioner, although this was really intended to prevent the abuses of "farming out" and arranging to dispose of unwanted children. Cardiff had taken the line that only medical officers should visit any nursing home, except that the senior health visitor had been approved to inspect some of the small maternity homes.

Dr. STELLA CHURCHILL said that the Act had revealed an appalling state of affairs, and the future was going to be worse unless there was some alternative to the private nursing home. The necessary alterations could not be put into practice by many of the homes, and they would cease to exist. Paying wards in hospitals were over-full, and large paying hospitals were needed. The Bill had raised the standard and would also increase the shortage of nursing homes.

A vote of thanks to the speakers was proposed by Dr. CHARLES PORTER, and seconded by the PRESIDENT, who remarked that the Act, although very incomplete, had already been abundantly justified.

Dr. BUCHAN, in reply, said he was very glad that the London County Council was acting as it was, but he thought the time would come when it would realise that its interpretation was not justified by the Act. Nursing homes were not profitable concerns, and sympathy with their owners should be shown in drawing up requirements.

Dr. HEWAT, in reply, said he had found the entry of payments very useful in disputes between keepers and patients about fees. The by-laws had been approved by B.M.A. headquarters before being sent out. The cheap nursing home was going to suffer, but those that went would not be missed, as it was impossible to provide proper nursing attention at three guineas a week. The Act would not close down the decent home.

Reviews and Notices of Books.

THE BRAIN FROM APE TO MAN.

By FREDERICK TILNEY, Ph.D., M.D., Professor of Neurology, Columbia University. With Chapters on the Reconstruction of the Grey Matter in the Primate Brainstem by HENRY ALSOP RILEY, A.M., M.D., Associate Professor of Neurology in the University. In two volumes, with 557 illustrations, many in colour. London: H. K. Lewis and Co., Ltd. 1928. Pp. 1120. 5 guineas.

IN two superbly printed and illustrated volumes Prof. Tilney has made a contribution to the study of the evolutionary aspects of the central nervous system on a scale never previously attempted. The book is largely devoted to the technical side of comparative anatomy, as far as the brain is concerned; it is based on the view that minute comparison of the morphology of that organ in different representatives of the higher mammals is calculated to illuminate differences in behaviour among them as well as between them and man. At the same time a study of this kind will accentuate and explain the relative resemblances among the primates. Some 15 years of the author's life have been occupied with the anatomical preparation of material from no less than 11 of the higher mammals, beginning with the lemur and inclusive of gibbon, orang, chimpanzee, gorilla, and man. In each the whole brain has been examined macroscopically and microscopically; its measurements have been taken and its salient features recorded; the research has ranged from the fissural pattern of the cortex to the minute anatomy of the brain-stem. The accounts are fully illustrated with photographs of microscopical sections as well as with ingenious coloured reproductions of the relative size and position of the various ganglionic collections of grey matter in the pons, mid-brain, and medulla. Preceding each description is a succinct narration of the habits of the animal concerned; at the end of the sections are summaries with interpretations and discussions of the behaviouristic and anatomical data in their bearing on the evolution of the primates.

In the midst of this almost overwhelming anatomical profusion the distinguished author has not lost sight of his goal, which is to show that analogies outstrip differences, and that graded advances up the scale to man correspond to definite changes in structure which illustrate in unmistakable fashion the reality of the evolutionary process. The first volume, as a fact, really paves the way to the still more fascinating second volume, in which are chapters dealing with primitive and prehistoric man, with his cranial relics, and with the reconstruction therefrom of his types of brain. It is worth noting that Prof. Tilney sees in the progressive development of the functions of the hand that stimulus to increasing intricacy and complexity of structure which characterises the successive changes in the morphology of the brain; and it is curious to think that in this respect he has followed, one century later, the speculations of Sir Charles Bell. He does not hold with those who assert that man has descended (or, better, ascended) from an anthropoid stock; rather does the evidence point to the existence of a common pre-human stock, at some infinitely distant period, from which both anthropoid apes and man have, separately, come. Five distinctions between the two constitute fundamental divergencies—viz., the human brain, the human foot, the human hand, the erect posture with bipedal locomotion, and a terrestrial mode of life. A natural corollary of such studies is the question whether evolution is at an end; to this a negative if speculative answer is given. Man has within himself a "structural plasticity for further development" which has been sacrified in the case of the apes. The more organised the encephalic patterns the less are they capable of modification; variations

are the very basis of advance. Prof. Tilney allows himself the pleasure of meditating on the future of man, which he thinks lies with the frontal lobes.

THE MATRIX OF THE MIND.

By FREDERIC WOOD JONES, Professor of Physical Anthropology, University of Hawaii; and STANLEY D. PORTEUS, Professor of Clinical Psychology in the University. Honolulu: University Press Association.[1] 1928. Pp. 457.

THIS book adds still another to the increasing number of volumes of recent years which incorporate more or less successful (or unsuccessful) attempts to blend the subject matter of the sister sciences—neurology and psychology. The appearance of these is doubtless a favourable portent, as the authors remark, even if psychological purists still write as though the mind were no more closely connected with the brain than with the larynx; and even if the central nervous system is studied by many neurologists in almost total disregard of its higher functions. Of course, certain prolegomena are requisite if the two aspects of function are to be usefully correlated; working hypotheses must bridge gaps, and assumptions are essential to take the place of what is not proven and may never be. The actual handling of the material in the book, though we are in sympathy with the general viewpoint of its writers, is puzzling. The first part provides a compendium of physiological anatomy, human and comparative, which is interesting in itself and embodies not a few relatively little known data; but the information is sometimes rather obscured by an expansive style and an unusual resort to rather elementary illustrations which make us wonder for what class of readers the work is really intended. This impression is not lessened by the titles of some of the sections: "The triumph of the pallium," "Mistakes in brain building," "What the cortex cannot do," doubtless represent the truth, but they do not appeal to the tutored mind. It is curious that these methods should be used, for the physiology of the first part is not only thoroughly modernistic, but is excellently expounded with an eye to its bearings on, and relations to, psychology. The second part is similarly unconventional, though it is none the worse for that; we read of "Built-in habits," "Neural crossroads," "Sense of aliveness" with relish, mildly tempered by an undercurrent of methodological criticism. Yet here again the facts are well set forth and their trend indicated with conspicuous fairness.

A number of useful illustrations and diagrams are supplied, but there are no bibliographical references.

ŒUVRES DE PASTEUR.

Edited by P. VALLERY-RADOT. Vol. V., *Études sur la bière*. Paris: Masson and Co. 1928. Pp. 361. With 12 plates and 85 text-figures. Fr.120.

PASTEUR did not care much about beer himself but his patriotic spirit was so moved by the events of 1870 that he set to work enthusiastically to find out how the French brewers might make something as good as the German product which was at the time incontestably superior and had a European reputation. Applying the principles which he had already established, he showed that all that was needed was cleanliness and protection from contamination with undesirable microbes. His studies culminated in his "Études sur la bière" published in 1876 (an English translation in 1879), and the greater part of this volume of his collected works is occupied with a reprint of this classic. It is, of course, of much more than technical interest and contains many of Pasteur's proofs that micro-organisms are real things, arising from similar organisms and having specific fermentative reactions. Pasteur visited English breweries in 1871 and there is included some correspondence with Tyndall and Lister.

[1] Messrs. Edward Arnold and Company inform us that they have taken over the British Empire and Continental rights of this book and that orders for it should be sent to them. A revised edition (probable price 21*s.*) is in the press and will be ready before Easter.

DENTAL ANATOMY.

Notes on Dental Anatomy and Physiology and Dental Histology. Fifth edition. By T. W. WIDDOWSON, L.D.S., Lecturer on Dental Anatomy and Physiology at King's College, London. London: John Bale, Sons, and Danielsson. 1928. Pp. 588. 25*s.*

THIS book was designed as a note-book for students preparing for examinations, to be read with larger and more formal text-books. In successive editions the size of the volume grew, but its character was retained. But in this fifth edition the scope of the book has been changed, and it has been transformed into a text-book of dental anatomy, which competes with such well-known works as those by Tomes and Mummery. It is a pity that the author has still retained a misleading title which does not now do justice to the contents of his book. While it does not contain the wealth of detail on comparative dental anatomy which has made Tomes's book so valuable to the serious student of zoology, or the original work on dental histology which distinguishes Mummery's treatise, it provides an extremely well-written and clear account of a subject which the average dental student usually dreads. The author has shown much skill in selecting the relevant points from the material at his disposal, and in giving the student the information essential for examination purposes. The opening chapters on cytology and embryology form a useful introduction, which is followed by an excellent account of the development of the jaws in which the work of J. C. Brash and E. Fawcett is fully described. The difficult subject of the evolution of tooth forms is successfully described, especially the complicated theory put forward by L. Bolk. The chief value of the book lies in the skilful way in which controversial points which might confuse the dental student are dealt with. The author deserves congratulation on an admirable production.

NARCOTIC POISONS AND ADDICTION.

Rauschgifte und Suchten. By Dr. FRITZ REDLICH. Bonn: Kurt Schroeder. 1929. Pp. 98. M.4.40.

IN a booklet of 98 pages, with numerous statistical tables and copious bibliographical references, Dr. Redlich reviews the world production and consumption of cocaine, opium, morphine, and heroin, literally and specifically from China to Peru. Figures are cited to show that, alike in the old world and in the new, cocaine has since the war become a more potent factor than formerly in the production of mental disorder, as well as in its illicit employment for vicious and criminal purposes.

The story of opium cultivation in China is told: its almost complete cessation in the years following the arrest of export to China of Indian opium from 1907 onwards, and the recrudescence of opium-growing during the civil wars. The method of Government monopoly of opium production and distribution in India is described; the continued export of Indian opium to eastern countries, other than China, and the large consumption of opium in certain townships in India and Burma are commented upon. The manufacture of morphine is, according to the available statistics, enormously in excess of any conceivable requirement for medicinal purposes. The amount of the drug, either licitly or illicitly imported into China—if the figures vouchsafed can be relied on—is appalling; from 1917 to 1920 20 to 30 tons are recorded as having been annually imported or smuggled into that country. The best that can be said for the morphinomaniac, according to Dr. Redlich, is that his criminality is more passive and less dangerous

than is that of the victim of cocainism. As regards heroin, prior to the Great War Germany had practically a monopoly of the manufacture of this alkaloid, but since the war Great Britain, Japan, Switzerland, and the United States have engaged in its production, but in the last-named the manufacture and importation of heroin has, since 1924, been forbidden by law. At the second Geneva Opium Conference such restriction, though advocated by the American delegation, was opposed by the French, German, and English representatives, who considered heroin to be an indispensable drug. Dr. Redlich regards 1½ tons of heroin annually as adequate for the world's supply for medicinal purposes. He confirms the view that heroin is the most pernicious and insidious of all narcotic drugs in its mental and moral effects.

In his final chapter Dr. Redlich discusses the problem of combating narcomania in its various manifestations. He agrees that the plan urged by the American delegates at Geneva, and adumbrated by the British delegates at The Hague Conferences—viz., limitation of production at the source of the raw materials and manufacture of drugs of addiction—would be successful, if only it were practicable. The alternative method advocated by Germany and supported by some other States, of an international syndicalisation of the drug traffic, is not free from objections. Questions would arise as to which countries should be the producers, and also as to the price to be charged, medical needs requiring a low one and the monopoly a high one. The author believes advance must be gradual, and by way of strict control of the manufacture and of the channels of distribution of dangerous drugs, and that this requires international coöperation of the police and heavy punishments for offenders in the matter of illicit traffic or consumption.

TRIAL OF EUGENE MARIE CHANTRELLE.

Edited by A. DUNCAN SMITH. Edinburgh and London: W. Hodge and Co. 1928. Pp. 243. 10*s.* 6*d.*

Chantrelle, a Frenchman teaching languages in Edinburgh, made a hasty marriage with one of his school-girl pupils who was only 16 when the first of their four children was born. She was a good wife, he a violent, cruel, and unfaithful husband. Finding his financial position difficult, his professional work falling off, and his debts increasing, he insured her life (in spite of her objections and to her manifest alarm) for £1000 against death by accident. On New Year's Day, 1878, she was alive and well; next morning the servant found her unconscious in bed. Chantrelle sought to suggest that she was poisoned by coal gas; he apparently tampered with a gas-pipe himself after his wife lost consciousness. Dr. James Carmichael was summoned; he sent for Dr. H. D. Littlejohn, the city medical officer, telling him there was a case of gas poisoning for him to see. Mrs. Chantrelle was removed to the Royal Infirmary where she died without recovering consciousness. At the infirmary Prof. Maclagan was strongly of opinion that the poisoning was not from gas, but from some narcotic. Post-mortem examination confirmed the view that gas had not caused death, but failed to prove the presence of a narcotic; subsequent chemical analysis of parts of the body gave no positive result. On Mrs. Chantrelle's night-dress and bedding there were stains of vomit in one of which opium was detected. The evidence against Chantrelle was circumstantial. He had dabbled a good deal in drugs and had a cupboard full of bottles, some of which contained opium. He had threatened to take his wife's life; he had the means and the opportunity; he had no affection for her; he had a strong financial motive for murder; his behaviour over the gas escape was highly suspicious. The jury having found him guilty, he made an injudicious outburst in which he seemed to throw over the gas poisoning theory and to accept the evidence of opium, thus weakening his previous defence.

Medico-legal readers of the trial will form their own opinion whether modern scientific evidence would not have been more conclusive. The medical witnesses 50 years ago had seen few cases of coal gas poisoning. Mr. A. Duncan Smith has edited the trial with such thoroughness as to include a full description of Chantrelle's last hours and execution. In his editing he was appropriately assisted by Emeritus Professor Sir Henry D. Littlejohn. The present Lord Snaw, it is interesting to note, was one of Chantrelle's counsel. The book first appeared in 1906 in the Notable Scottish Trial Series. Uninstructed English readers might have been glad of some brief note on Scots law phraseology and the distinctive features of Scottish procedure such as the absence of a coroner's inquest and the omission of an opening speech for the Crown.

PROTOZOA.

Lehrbuch der Protozoenkunde. Founded by FRANZ DOFLEIN. Fifth edition. Revised by Prof. Dr. EDUARD REICHENOW, Departmental Director at the Institute for Marine and Tropical Diseases, Hamburg. Part II., *Spezielle Naturgeschichte der Protozoen.* First half: *Mastigophoren und Rhizopoden.* Jena: Gustav Fischer. 1928. With 435 text-figures. Pp. 326. M.22.

PART I. of the fifth edition of this well-known treatise on protozoology was reviewed in THE LANCET, 1928, i., 914. It dealt with general principles without any special reference to parasitic forms, though these received ample consideration. The first half of Part II. begins with the classification of the protozoa and discusses in detail the mastigophora and rhizopoda, concluding with a classification of the sporozoa which, with other groups not dealt with in this section, will form the subject matter of the second half of Part II.

Prof. Reichenow has adhered to the arrangement of the original author, Franz Doflein, but much new matter has been introduced, particularly in connexion with parasitic forms which produce disease in man and animals. In this respect the present edition is a distinct improvement on the earlier ones, in which the human parasitic protozoa received inadequate attention. Now, however, the protozoologist will find in it a clear and accurate account of these important organisms, and the work has thus become as useful to the medical man and veterinarian as to the zoologist. The protozoa are subdivided into Doflein's two main groups, the plasmodroma and ciliophora. The former, with which the first half of Part II. is mainly concerned, is subdivided into the classes mastigophora, rhizopoda, and sporozoa, the mastigophora preceding the rhizopoda as representing the more primitive forms. The subject matter is handled in the careful manner which we expect from the authors. When the work is completed the library of protozoologists will be enriched by a comprehensive treatise, beautifully and profusely illustrated.

FROM THE MONOTREMES TO THE MADONNA.

By FABIUS ZACHARY SNOOP. London: John Bale, Sons, and Danielsson, Ltd. 1928. Pp. 143. 3*s.*

THIS little book claims to be a study of the breast in culture and religion. In spite of its alliterative title and certain tricks of style which may irritate some readers, the book is obviously the work of an extremely well-read person. It seeks to prove that the ideas which surround the breast in folk-lore, literature, and art lead to fundamental characteristics of religious belief and human behaviour. Perhaps the most interesting chapters are those on Aaron's Breastplate and the significance of jewellery worn on the breast, on Mountains of Myrrh, dealing with the art of and reasons for perfumery, and the Bloody Teat, on injuries of the breast inflicted in the interests of culture. Some of the author's ideas and opinions, though interesting, will not meet with general acceptance.

JOURNALS.

JOURNAL OF PATHOLOGY AND BACTERIOLOGY. Vol. XXXII., pp. 1–172. January, 1929. — Focal Necrosis of the Liver, by J. W. Edington (Sheffield). The characteristic change found in guinea-pigs infected with *Bacillus aertrycke* may be reproduced by tying the common bile-duct and injecting various organisms or toxins subcutaneously. The lesions are localised by biliary stasis.—Chronic Peptic Ulcer of the Œsophagus, by M. J. Stewart and S. J. Hartfall (Leeds). Epigastric pain and recurrent hæmatemesis; death from perforation into right pleura.—"Smooth-rough" Variation in Bacteria in its Relation to Bacteriophage, by F. M. Burnet (London).—Retro-peritoneal Ganglionic Neuroma, by D. F. Cappell (Glasgow). A very large tumour composed of adult ganglion cells and nerve-fibres and correspondingly benign.—Three Notes on Tuberculin, by H. J. Parish and C. C. Okell (London). Tuberculins are very stable and heat-resistant. Skin sensitiveness develops in guinea-pigs in a week after infection.—The Relationship between the Hæmolytic Complement and the Opsonic Power of Normal Guinea-pig Serum, by J. Gordon, H. R. Whitehead, and A. Wormall (Leeds). Destruction of hæmolytic complement by ammonia does not greatly reduce the opsonic power of the serum.—The Nervous System in Rats Fed on Diets Deficient in Vitamins B 1 and B 2, by R. O. Stern and G. M. Findlay (London). Absence of both factors or of the antineuritic factor does not cause any specific lesions in the nervous system despite the occurrence of paralytic symptoms. Absence of B 2 produced symptoms and skin lesions like pellagra with vacuolation and pigmentation of motor cells in the cord.—A Case of Diabetes Mellitus with Acromegaly and Lipæmia, by J. Gray (Aberdeen). Death from diabetic coma: cirrhosis of pancreas, chromophobe adenoma of pituitary.—The Isolation of *Bacterium morgani* from the Mammals, Birds, and Reptiles at the Zoological Gardens, by R. Lovell (London). Morgan's bacillus seemed to be the cause of death in four monkeys, one bird, and four reptiles.—Notes on Intestinal Bacilli, with Special Reference to Smooth and Rough Races, by P. B. White (London). Rough races probably afford the better basis for a rational classification.—Diffuse and Nodular Fibrosis of Adventitia of Aorta, by W. G. Barnard (London). A remarkable overgrowth of the adventitia up to 10 mm. thick of dense fibrous tissue, probably rheumatic.—Generalised Vaccinia in Rabbits with Especial Reference to Lesions in the Internal Organs, by S. R. Douglas, W. Smith, and L. R. W. Price (London). A condition resembling alastrim may be produced in rabbits in which almost all the organs except the kidneys show lesions. Virus may remain latent in the tissues for as long as six weeks after infection.—Standardisation of Antidysentery Serum: Effect of Increased Test Dose on the Accuracy of the Titration, by A. V. Blake and C. C. Okell (London). A considerable increase in precision is obtained by using five times the usual test dose of bacillary bodies.—A Statistical Note on the Testing of Antidysentery Sera, by J. W. Trevan (London). Statistical discussion of the preceding paper generally applicable to such experiments.—Siderosis of the *Globus pallidus*: Its Relation to Bilateral Necrosis, by G. Hadfield (London). The blood-vessels of the *Globus pallidus* are often degenerate and encrusted with iron salts (formerly described as "calcification"); this explains the bilateral necrosis often found in CO poisoning which is not immediately fatal.—Experiments on the Nature of the Carcinogenic Agents in Mineral Oils, by C. C. Twort and J. D. Fulton (Manchester). The active agents are concentrated in extracts made with methyl sulphite, methyl sulphate, or picric acid, and rendered inactive by treatment with sulphuric acid or silica gel, and by oxidation or reduction.—Neuroglial Tumour of Spinal Cord, by W. G. Barnard (London).—A Simple Method of Preparing Accurate Pen and Ink Drawings of Specimens, by T. Shennan (Aberdeen). An ordinary photo print is inked in as desired with India ink and bleached with iodine and "hypo."—Generalised Osteosclerosis, by F. Parkes Weber (London). A typical example of marble bones with severe anæmia.—Demonstration of the Peculiar Bodies of Pulmonary Asbestosis in Material Obtained by Lung Puncture and in Sputum, by M. J. Stewart and A. C. Haddow (Leeds).

THE Published Papers by Members of the Staff of the Middlesex Hospital Medical School for the year 1927–28 have been issued in the usual form of a collection of reprints of various shapes and sizes bound in one volume. Most of the papers have already been published in widely circulated journals and need no further reference. An address delivered at the Lake Mohonk Conference on Cancer Control in May, 1927, by Mr. Sampson Handley, here reprinted, gives an interesting account of the development of cancer education in this country. Dental research is represented by an important paper by Mr. Warwick James and Dr. A. Counsell on the primary lesion in so-called pyorrhœa alveolaris, and by a paper by Dr. Lazarus Barlow on the bacteriology of the alveolar bone in relation to pyorrhœa. The physiological department is responsible for many interesting papers, especially one on the ethyl iodide method for the estimation of the circulation rate in man by Dr. Samson Wright and Mr. M. Kremer. An outstanding contribution from the pathological side is the article by Mr. D. H. Patey and Dr. R. W. Scarff on the position of histology in the prognosis of carcinoma of the breast, reprinted from our own columns. A lecture on the ovarian hormone by Prof. E. C. Dodds sums up a large amount of work by himself and his colleagues in the Courtauld Institute of Biochemistry.

New Inventions.

AN IMPROVED BOX FOR USE AFTER SUPRAPUBIC CYSTOTOMY.

THE box shown in the illustration is an improvement on the old Hamilton Irving box which is wrong mechanically. The latter consists of an oval box which has to adjust itself to a convex or concave surface; to this end it is held by four straps, which can never maintain an equal tension; with each movement the

patient tightens one at the expense of the rest, and this results in displacement of the box and causes leakage. The new box consists of a section of a sphere fixed at its top central point (by a single band of half-inch elastic), so that pressure is distributed equally to every part of the rim. Thus, with every movement of the patient the sphere of the rim adjusts itself mechanically to the convex (or concave) surface of the abdomen.

The boxes are made for me by J. H. Montague, 69, New Bond-street, London, W.

SYDNEY G. MACDONALD, M.B., B.Chir.Camb., F.R.C.S.Eng

THE LANCET.

LONDON: SATURDAY, JANUARY 26, 1929.

THE KING'S HEALTH.

THE announcement on Tuesday last by HIS MAJESTY'S doctors that the time was approaching when the patient might be removed safely to the South Coast has been regarded widely as a landmark in the long story of the illness. Although the public has been expressly warned that the period of convalescence cannot yet be regarded as having set in, it is highly reassuring to note that the KING'S medical advisers can contemplate for him a somewhat lengthy journey by road or rail in the immediate future. The place of residence has been chosen for its close proximity to the sea, its southern exposure, and its protection from wind, while the location is associated with a measure of privacy and provides reasonable access to London. Bognor is regarded as one of the sunniest of the South Coast health resorts. Its rainfall averages under 26 inches in the year, and there is but little fog or frost, while in the commencing Spring the north-easterly winds are kept off the seaboard by the nearness of the South Downs. The mean temperature of the winter months is about 42° F., and there is an average of 2·8 hours of sunshine a day, being about 30 per cent. of the possible hours during which the sun is above the horizon. Craigweil House, which has been lent for the reception of the KING by Sir Arthur Du Cros, has been extensively altered since it was used by the late Dr. A. H. Stocker as a convalescent station for his London patients, and the large grounds, gently falling to the strand, afford ample scope for exercise and for the assistance to convalescence under conditions of perfect privacy. Craigweil House not only enjoys a full South exposure, but has been equipped with rooms specially designed for sun treatment. The stimulating quality of the sea air is likely to be helpful, both in its generally invigorating qualities and in its special aid to the restitution of damaged tissues. The empyema wound is now stated to be small and steadily healing, and the relative unimportance of this complication may be gauged by the fact that twice during the past week Sir Hugh Rigby has not been asked to sign the official bulletin. Under such conditions we may reasonably hope that convalescence may soon be reached. Especially encouraging is the announcement that solid food is now being enjoyed, for it is an open secret that for a long time it required HER MAJESTY'S constant assistance to ensure that nourishment of any kind was taken.

Once again we may congratulate the KING'S medical advisers on the fruition of their devoted labours, and on having found in the Royal household so ready an acceptance of the measures which they considered desirable to employ. It is generally believed that nowhere can better treatment be found than in one of the large general teaching hospitals of London, but HIS MAJESTY'S wonderful recovery may lead to a justifiable suspicion that in one household these conditions have been bettered. The KING'S health will still take the central place in the interest of his subjects, though all the indications are that the story will now be uneventful even if prolonged.

TONSILLECTOMY FOR ARTHRITIS.

THE part played by the infected tonsil in the production of chronic disturbance in distant-lying organs is being closely studied in this country and in America. In setting out recently [1] some of the evidence for this belief, it was remarked that the culpability of the tonsil is not easy to establish in the group of conditions generally called rheumatic. A. D. KAISER, of Rochester, N.Y., in examining the records of 48,000 school children, found [2] that the incidence of rheumatic fever and joint pains was slightly less in the 20,000 whose tonsils had been removed than in the remainder in whom they had not been removed, and some earlier work at the Mayo Clinic aimed at assessing the effect of tonsillectomy performed after subacute joint trouble had already set in. This week, in our own columns, Mr. A. B. PAVEY-SMITH, of Harrogate, records an analysis of the results of tonsillectomy performed at the Royal Bath Hospital there. Of the 7000 cases of arthritis and allied diseases treated at this hospital in the six years under review, some 400 were sent to Mr. PAVEY-SMITH on account of conditions falling under the three headings of subacute rheumatism, chronic infective (focal) arthritis, and fibrositis. From these he chose about 200 of ages ranging from 10 to 64 as suitable for tonsillectomy, which was accordingly performed. His observations on them lead him to think that a probable tonsil focus can be found in a large number of cases falling into these three groups, and he says that when the tonsil is removed the results are so good in one group—namely, subacute rheumatism—that tonsillectomy should become a routine part of its treatment if only as a prophylactic against recurrence and cardiac complication. He claims that even when septic tonsils have caused chronic inflammation in joints improvement from their excision may be expected in 80 per cent. of cases, provided that the tonsil actually shows one or other of the stigmata of infection. He admits, however, that systemic infection can never be deduced from the appearance of the tonsil itself; it can only be inferred. We regard Mr. PAVEY-SMITH'S observations as worthy of record and his figures as distinctly favouring the conclusions which he draws. His cases had the merit of being taken serially, although they lack comparison with a control group of similar cases treated without operation and watched for a similar length of time. It may be that no such valid control is obtainable, but it would be of interest to follow up the 200 other patients who were referred to him on account of focal sepsis and in whom he failed to find enough evidence to justify tonsillectomy. The class of case included in the series is so common and so distressing in its disability and chronicity that the success of so simple a remedy would be very heartening to the practitioner who may be overwhelmed by the number of such cases and his comparative helplessness in the face of them. Apart from the clinical evidence in his paper, Mr. PAVEY-SMITH adduces evidence which increases the suspicion under which the *Streptococcus viridans* already lies as the primary infective agent in chronic focal arthritis. The occurrence of the organism is, in fact, so frequent as to imply that it must either be an active agent or count for nothing at all. In this matter any effective control might be still more difficult to devise.

[1] THE LANCET, 1928, ii., 1248.
[2] Jour. Amer. Med. Assoc., 1927, lxxxix., 2239.

YELLOW FEVER.

TWENTY-EIGHT years ago WALTER REED'S Cuban Commission proved that yellow fever is spread by mosquitoes, and after a campaign of 90 days the city of Havana was freed from infection for the first time in 200 years. It then seemed that the disease had ceased to be a major menace to life in the American and African tropics; it seemed that the victory of scientific method was complete and that scientific tactics would shortly clear the danger zones of all their smouldering infection. But while these hopes have been largely realised in America we are faced in West Africa with a situation that grows more threatening with every new facility for rapid transport. Yellow fever still lingers in the colonies and protectorates up and down that coast, and its presence has become important to sanitarians of other countries because it is now within the bounds of possibility that the virus may be disseminated among mosquitoes in distant parts of the world. Not only is the ordinary vector—*Aëdes aegypti* (*Stegomyia fasciata*)—found throughout the tropics and subtropics, but it has been shown that other mosquitoes even of a different genus are capable of carrying the disease. The shortness of the time of incubation is no longer a certain obstacle to the passage of infected persons across the African continent, and it is feared that yellow fever may travel by relays into the Orient just as once it may have travelled to America by way of slave ships. So, in Sir WALTER FLETCHER'S words, "It is no stretch of fancy to say that the discovery of the true nature of the disease and of its preventability by vaccination may have come just in time to save us from a world disaster of unthinkable magnitude." Yellow fever investigators, as he says, are playing for high stakes, and this is the justification for the hazard of so many valuable lives.

Those who know the story of WALTER REED'S researches will recall that the members of his Commission risked not only their own lives but also those of many volunteers whose names and deeds have mostly been forgotten. Deaths from yellow fever among the American troops in the Spanish War had far outnumbered the fatal battle casualties, and REED was clearly right in deciding that it was worth while to make further sacrifices if thus and thus alone it could be discovered how to prevent the disease. But once the main problem of transmission had been solved and the emergencies of war were over, it was impossible for his successors in research to experiment with human beings where so deadly an infection was concerned. The odds were thus against them, for almost all attempts failed to transmit the virus to monkeys, dogs, rabbits, guinea-pigs, or other animals, and all these possible hosts were found unsatisfactory for practical purposes. As is well known, NOGUCHI reproduced in guinea-pigs a condition which he regarded as identical with yellow fever and which he said was due to the *Leptospira icteroides*. For many years, indeed, this held the field as the causal organism of yellow fever, and was used extensively in the manufacture of vaccines; but we now know that it in no way differs from the *Leptospira icterohæmorrhagiæ* of Weil's disease and must attribute the confusion to erroneous clinical diagnosis or to coexistence of the two infections in certain cases. Controversy over the significance of the leptospira gave rise to suggestions that African and American yellow fever were not the same disease, and these and other doubts and difficulties could not readily be solved as there was no animal on which to make the necessary tests. Hence we may say that the renaissance of yellow fever research dates from 1927 when ADRIAN STOKES, J. H. BAUER, and N. P. HUDSON discovered that Asiatic monkeys, notably the *Macacus rhesus*, are susceptible to the virus. Previous experiments with African monkeys had always failed, but it has now been ascertained that several species of macacus, including *cynomolgus*, can be used for laboratory studies. The work undertaken by STOKES and other members of the Rockefeller Commission at Lagos at once confirmed the statements of REED'S and MARCHOUX'S commissions by proving that yellow fever virus will pass through V and N grades of Berkefeld filters. Infected organs were found to retain their virulence for at least 18 days if kept frozen—HINDLE claims, indeed, that liver or blood dried in vacuo will remain virulent indefinitely—and these discoveries have made it possible to start research on yellow fever in northern countries where natural infection is unknown and where the conditions of experiment are therefore easier. In March of last year Dr. A. W. SELLARDS, of Harvard University, brought to London the liver of a monkey infected from a patient at Dakar, and this strain has been the basis not only of HINDLE'S investigations but also those of A. PETTIT and others in Paris.

The latest news of Prof. EDWARD HINDLE'S studies is summarised on page 183, and our readers will see at once how fruitful they have been. Profiting by the knowledge of filterable viruses which has accumulated recently in this country from the study of dog distemper and fowl plague, he was able, on receiving yellow fever virus, to prepare a vaccine which is extremely potent in protecting monkeys against the disease. Last June he showed that phenolised glycerine emulsion of the liver and spleen of infected monkeys confers immunity against 10,000 to 100,000 lethal doses of the virus, and the preparation by which he has now superseded it is equally effective in protecting animals. Its value to human beings is, of course, less easy to assess, but there is every reason to suppose it considerable. A vaccine made according to a slight modification of HINDLE'S recipe has been tried at Rio de Janeiro by H. DE B. ARAGÃO, who has used it without ill-effects in 300 or 400 cases and has arranged for its preparation on a large scale by the Brazilian Public Health Department. Our own Colonial Office has also decided to give HINDLE'S vaccine a trial, and its employment in the West African colonies will be watched with deep interest.

Prof. HINDLE'S own experiences bear witness once again to the risk of working with yellow fever in the laboratory, and it now seems certain that the virus may enter the body not only by the bite of insects but also through mucous membranes and possibly even through intact skin. The fact that the serum of convalescents confers a transient immunity has been used by members of the Rockefeller Commission and others to protect those in close contact with the disease, and attempts are being made in PETTIT'S laboratory and elsewhere to prepare a serum strong enough to modify the course of the illness once it has begun. No such powerful remedy has yet been made, and for the present our hopes lie wholly in preventive measures. These must partly depend, however, upon the early recognition of incipient epidemics, and here the susceptibility of rhesus monkeys is of incalculable value. The blood of a

patient as a rule contains the virus during the first three days of his illness, and its injection into monkeys should reveal the true nature of the fever, whilst the serum of a convalescent will confer an immunity which is equally characteristic. This use of monkeys will have to continue until some serological reaction has been devised to take its place, and these animals will have to be supplied without stint since diagnosis followed by efficient vaccination is our best means of combating the disease in places which cannot at present be rid of the mosquito. It is now understood that native populations have a high resistance to infection, and that yellow fever occurs among them in all forms from the very mild to the severe and fatal; and the existence of cases which are unrecognisable clinically is of course an ever-present peril. But if they can be diagnosed correctly and if (as we earnestly hope) HINDLE's vaccine is capable of immunising large numbers of people without difficulty or danger, the problem of yellow fever in Africa will be well on the way to solution, and we shall be able to wait with equanimity for further light upon the characteristics of the causal virus.

"MASTERLY INACTIVITY" IN THE TREATMENT OF SYPHILIS.

LAST week we gave an account of some Norwegian studies in syphilis which raise again the question of late neuro-syphilis in relation to the modern treatment of the disease. The late CÆSAR BOECK, professor of dermatology in the University of Christiania (Oslo), used to teach that the so-called specifics, potassium iodide and mercury, are symptomatic remedies which not only fail to eradicate the disease, but also paralyse the body's natural defences, with the result that the disease runs an atypical course and inflicts serious injuries on certain internal organs, particularly the central nervous system. The validity of this theory was tested by two of BOECK's successors, Prof. BRUUSGAARD and Dr. S. DAHLSTRÖM, and the results of their investigations are very striking. Of 2181 patients suffering from primary and secondary syphilis who had attended BOECK's clinic between the years 1891 and 1910 and were treated by BOECK's method of "masterly inactivity," only 0·6 per cent. developed general paralysis and half that number suffered from tabes. In the discussion which followed Prof. BRUUSGAARD's paper Dr. DAHLSTRÖM pointed out that the commonly accepted computation of the frequency with which cases of syphilis end in general paralysis is about 4 per cent., and that during the 18 years he had been practising as a psychiatrist he had been on the look-out for paretics among BOECK's old patients, but had found hardly any, whereas patients who had been treated with mercury frequently reappeared with signs of general paralysis.

The whole question of the anti-syphilitic remedies has often been revived since the introduction of the newer methods of treatment with salvarsan or one of its many derivatives, and with bismuth. Many authorities hold the view that this treatment has resulted in more cases of late neuro-syphilis, while other equally competent observers maintain the reverse, and affirm that many of the cases which do occur result from insufficient treatment of the disease in its secondary stage. It is well known that unless maximal doses of the drug are given sufficiently often in a course, and without too long an interval between the courses, arsenic-resistant strains of the spirochæte may develop in the body, and ultimately these may produce neuro-syphilis and other visceral lesions. In order to prevent this untoward event efficient treatment with mercury or bismuth is recommended either concurrently with the arsenic or subsequently, and between these combined courses the administration of large doses of iodides is advised. It appears that the modern antispecific treatment of syphilis is receiving somewhat of a check, for it is now recommended by some continental authorities that non-specific remedies—and notably malarial therapy, which has already achieved such remarkable success in the treatment of general paralysis—should be employed in the treatment of early syphilis. KARL ZIELER, who has recently written upon this subject,[1] is of opinion that malarial therapy is not a method suitable for general application and that it can only be used in hospitals. Moreover, he says, it does not always prevent subsequent neuro-syphilis, and it should only be used, he thinks, when ordinary treatment has failed to render the cerebro-spinal fluid Wassermann-negative.

The problem of the conflict between the invading spirochæte and the defensive mechanism of the invaded body, and the ultimate effect of our interference, either by the older methods of treatment with mercury and iodides or the newer methods with salvarsan and mercury or bismuth, is worthy of closer study. So far as we are aware there are no figures at all comparable with those of BOECK's available in this or any other country, and it would probably be difficult in the present state of medical opinion to find practitioners bold enough to adopt BOECK's method of treating syphilis by withholding all the recognised antispecific remedies and simply maintaining the patient's defensive mechanism. It should be possible, however, to follow up the after-histories of a specified group of syphilitic patients who had received adequate treatment with modern antispecific remedies, with the view of ascertaining what proportion of these patients are showing signs or symptoms of late syphilis of the central nervous system or other viscera. L. W. HARRISON estimates that during the war 100,000 men in the Army received treatment for syphilis, but most of these, of course, are now absorbed into civil life and could not be traced. It should be possible, however, to follow up the cases which occurred in the Navy, and valuable information might thus be obtained by which an authoritative reply to this very important question could be given. Syphilis still presents many problems which in the present state of our knowledge (or ignorance) elude solution. Why is it that the disease as we see it to-day is so much less virulent than it was 30 or 40 years ago? Is it because we are becoming to some extent immunised or that the spirochæte is becoming attenuated, perhaps as the result of the modern methods of attack? How can we explain why (as sometimes happens) only one child in a family suffers from congenital syphilis, with healthy brothers and sisters older and younger than itself? Why is it that the mothers of congenitally syphilitic children, though they are usually Wassermann-positive, rarely give a history of primary or secondary lesions or indeed of any ill-health? What is the significance of the fact noted by P. C. JEANS in America, and DAVID NABARRO in this country, that 70 or more per cent. of the fathers of syphilitic children give a negative Wassermann reaction and often deny any history of infection or of treatment? It must be left to the future to furnish the answers to these and other important questions.

[1] Deut. Med. Woch., June 22nd, 1928.

Annotations.

"Ne quid nimis."

VITAL STATISTICS FOR 1928.

THE Registrar-General has issued a provisional statement of the figures for birth-rate, death-rate, and infantile mortality during the year 1928.

—	Birth-rate.	Death-rate.	Infant mortality-rate.
England and Wales ..	16·7	11·7	65
107 county boroughs and great towns including London	16·9	11·6	70
156 smaller towns ..	16·7	10·6	59
London	15·9	11·6	67

The smaller towns are those with a population in 1921 of 20,000–50,000. The death-rate for England and Wales (which is based on the estimated population in 1928) relates to the whole population, but that for London and the two groups of towns (based on the 1927 estimate) relates to the civil population only. Birth-rate and death-rate are per 1000 population, infant mortality-rate per 1000 live births.

The Registrar-General remarks that the birth-rate is 0·1 per 1000 above that of 1927. The death-rate is 0·6 per 1000 below that of 1927 and only 0·1 per 1000 above the lowest recorded (1923 and 1926). The infant mortality-rate is the lowest on record, 4 per 1000 births below that of 1923. These provisional figures, which are not likely to require substantial modification, have been issued for the information of medical officers of health.

INTRAVASCULAR CLOTTING.

THROMBOSIS is stated to occur in something over one per cent. of all operations, and the same incidence seems to hold good for parturition. If the suggestion of F. de Quervain is accepted that a considerable proportion of the cases of post-operative pneumonia is due to the formation of thrombotic emboli thrombosis may be an even more common sequel of operation than is suspected. There is no indication that the incidence of post-operative thrombosis has diminished within the last 20 years. Indeed, in Germany it is stated to show a considerable increase since 1922. In any case the problem of the causation of this condition is of sufficient importance to arouse the interest of surgeons and obstetricians. The recent discussion on this subject by the combined sections of Obstetrics, Surgery, and Pathology of the Royal Society of Medicine, of which a report is given in another column, has shown that clinical evidence is unable to throw much light on the problem and that its solution must come from the laboratory. Indeed, the most important contribution to the discussion did come from the laboratory in the opening remarks by Dr. W. Howel Evans. The observations of Dr. Evans and his collaborators have recently been published,[1] and were then the subject of a detailed review in our columns.[2] It is, therefore, only necessary to state briefly that in a large number of operations a great increase in the number of blood-platelets was found to occur after the operations, and the same was observed after childbirth. The rise begins about the fourth day, increases to a maximum about the tenth day, and then falls slowly back to the normal level. The rise in the platelet count was accompanied by a shortening of the coagulation time of the blood when measured outside the body. It is remarkable that, clinically, thrombosis occurs most frequently at about the time that the rise in the platelet-count reaches a maximum. It must be noted that none of the surgical cases on which the platelet counts were made developed thrombosis. Dr. Evans expressed himself very cautiously in appraising the significance of this new and important observation, and it is clear that further investigations are necessary to determine whether a platelet rise above a certain limit is in itself sufficient to induce thrombosis or whether additional factors are involved in it. But his work has opened up a way of attacking at least one aspect of the problem by experimental methods. By performing operations on animals it may be possible to determine the factor, or factors, responsible for the post-operative rise in the blood-platelets. The suggestion by Mr. D. H. Patey that stasis of the circulation plays an important part in the onset of thrombosis seems well founded. It is important from the practical point of view, because it offers a means of preventing thrombosis by avoiding conditions favouring stasis. On the other hand, the suggestion made by another speaker of injecting anticoagulants would hardly be justified in the light of our present knowledge of the mode of action of these substances. The action of such a substance as heparin is transient, lasting only for a few hours, and is followed by a reaction in the opposite direction, as a result of which the coagulability of the blood is increased.

It may seem curious that the ætiology of thrombosis is so little understood when the physiological literature on blood coagulation fills literally volumes. But, as pointed out recently by Dr. J. W. Pickering in his excellent monograph,[3] "The Blood Plasma in Health and Disease," physiological and biochemical work on blood coagulation is, with very few exceptions, characterised by a disregard of the blood-platelets. Indeed, in this country, with the single exception of the Edinburgh School of Physiology, where, under the influence of Sir Edward Sharpey Schafer, histology has been taught as an integral part of physiology, and where the work of W. Cramer and of J. Tait has demonstrated the important part played by the platelets in blood coagulation, physiologists have categorically denied the presence of blood-platelets as living cellular elements existing in the circulating blood. It is to be hoped that this discussion, by emphasising the importance of the blood-platelets in the ætiology of an important pathological lesion, will help to remove this erroneous teaching and stimulate further research into the physiology of the blood-platelets.

[1] Jour. Path. Bact., 1928, xxxi., 883.
[2] THE LANCET, 1928, ii., 982.

THE CENTRAL ASSOCIATION FOR MENTAL WELFARE.

IT is characteristic of our country that much of the best and most of the pioneer social work is carried out by voluntary bodies which are remarkably efficient and well organised. An example of fine voluntary work for the public health is afforded by the Central Association for Mental Welfare (C.A.M.W.), which continues to point the way to long-overdue legislation for the subnormal population. The Mental Deficiency Bill passed through Parliament at the end of 1927, largely owing to the unremitting efforts of the Association's members. During the following year work was organised in three areas where the local authorities have not been able to administer the Mental Deficiency Act, and central organisers stayed in the districts until a local organisation was well established. A valuable department of the work is the educational courses provided for all whose work brings them into contact with defectives. The report states that it is increasingly difficult to find experienced and competent people to fill administrative teaching and nursing posts as they fall vacant.

[3] William Heineman n, London, 1928.

Representations have been made to the University of London, urging the authorities to institute a post-graduate course of psychiatric training for social workers; courses have been held by the Association, and workers have been trained at the central office. A special course was held in May for medical men and women; 28 of the 45 who attended were school medical officers. Another course was held for magistrates and was greatly appreciated. The courses for teachers are well established and over 1000 teachers have now been through them, but there is still an inadequate supply of suitable workers for special classes of dull and backward children. A variant of the teachers' course was held at the request of the Board of Control for inquiry officers and supervisors of occupation centres. There are now 109 occupation centres in England and Wales, most of them under the direct management of their local associations. Four new centres were opened during the year under review—a feat which involves a great deal more work than most people would imagine. Before a centre can be opened numbers of children have to be visited, those suitable for the centre have to be selected, parents' consent has to be obtained, premises found, committee formed, grants obtained, staff trained and appointed, and arrangements for transport made. The guardianship scheme is, in the absence of institutional accommodation, the most fruitful method of dealing with defectives. The C.A.M.W. has now made its scheme self-supporting and so extensive that an assistant officer has become necessary. The work at the office shows no sign of diminishing, but it is interesting to learn that far more "better-class" parents now apply for advice. It is no easy task to find a suitable institution for a defective, even for families who can afford to pay, but the Central Association has all the information docketed, and can often direct guardians to the most suitable colony or home. A register of nurses and governesses is also kept, but here, again, the demand greatly exceeds the supply. Certain trades employ large numbers of defectives, and the association is naturally anxious to have access to their records. Up to date three of the principal trade-boards have agreed to give information and four others are willing to supply figures without names. A hopeful offshoot of the Association is the Child Guidance Council, now a separate organisation with its own Council, offices, and staff. As is well known, the Commonwealth Fund of America is coöperating with this Council, and a Child Guidance Clinic is to be opened in London shortly. Five of the C.A.M.W. social workers have had a year's special training at the New York School of Social Service at the expense of the Commonwealth Fund, and the Secretary, Miss Evelyn Fox, has paid a three months' visit to various centres of work in America.

ICTERUS NEONATORUM.

THE origin of the so-called physiological jaundice of the newly born presents a problem which is still to a large extent unsolved, while a constant succession of theories has kept alive the interest which has been taken in it by the physiologist and the physician. Since the days of Morgagni, who attributed it to plugging of the bile-duct by milk curds—a view amended by Virchow to a similar action of mucous plugs—a series of explanations have been propounded of which few have stood the test of time. In recent years explanations which refer the origin of the jaundice to the alimentary tract have receded from favour, the field being occupied by two principal theories—namely, hæmatogenous and hepatogenous origin. The balance of opinion, at any rate in this country, has favoured the former view, in some degree as a result of the confirmation given to it by the van den Bergh reaction. Nevertheless the hepatogenous view, in favour of which A. Yllpö has adduced much cogent reasoning, has not been without its supporters. Prof. P. Lereboullet,[1] who has long been a contributor to the literature of the subject, suggests in an interesting review that the hæmatogenous and hepatogenous theories are by no means as mutually exclusive as has been represented by their respective exponents. From the clinical aspect Prof. Lereboullet reminds the reader of three important facts: (1) that the icterus is preceded by an erythrodermic phase; (2) that the fæces are not decolorised; and (3) that the jaundice is in most cases acholuric. Its occurrence is especially frequent in twins, and in infants born prematurely or after difficult labour. The most important fact established by experiment is that the blood of the infant at the moment of birth contains bile; there is a physiological bilirubinæmia independent of the subsequent development of jaundice. It is also found that the blood of the cord contains less bile than that of the fœtus, and the maternal blood contains three times less bile than the blood of the cord. Hence it may be inferred that the blood returning from the placenta loses some of its bile-pigments in the maternal circulation, and that from the point of view of the fœtus the cord represents the main path of excretion of bile-pigments, only a portion passing into the meconium. It is undoubtedly true that a tendency to hæmolysis is present in the first few days of life; that is seen in the erythrodermic phase which so often precedes jaundice and which may be attributed to hæmoglobinæmia. These two factors, hyper-hæmolysis and hyper-cholæmia, are therefore present in *normal* infants after birth. At birth the ligature of the cord puts an abrupt termination to the path of excretion of the greater part of the fœtal bile. As a result of this, the bile content of the blood rises, just at the moment when the existing number of the red corpuscles is becoming in excess of the infant's requirements. The kidneys have not as yet acquired the faculty of excreting bile, as is shown by the acholuric type of jaundice. The liver is in process of acquiring this faculty, but jaundice will occur in infants in whom it is not acquired with sufficient rapidity to keep pace with the hypercholæmia occasioned by ligature of the cord and accentuated by hæmolysis.

[1] Paris Médical, Nov. 3rd, 1928.

DUST AND TUBERCLE.

THE evil effects on the respiratory system of the inhalation of various forms of dust have been recognised for many years. Clinical and pathological investigations have shown that while some dusts are relatively innocuous, others, notably the hard silica dusts, produce profound changes in the lungs and influence very definitely the development of certain infections, especially tuberculosis. This much is generally accepted, but the exact method by which the pulmonary changes are brought about is not yet settled. And there is still less agreement as to the way in which the silica helps in the progress of the tuberculous process. The matter has been subjected to experimental investigation by many workers but with inconclusive results. It is easy enough to show that silica has a deleterious action on the tissues of the body, which, if continued, is followed by extreme fibrosis; and it can also be demonstrated in laboratory animals that the presence of silica increases the pathogenicity of the tubercle bacillus. But the production of the pulmonary lesions with which we are familiar in stone-masons and quartz-miners has yet to be achieved. The difficulty probably lies in the choice of the experimental animal. Rabbits and guinea-pigs can be exposed to dust atmospheres containing a vastly greater concentration of silica than any to which an industrial worker would ever be subjected, but they do not develop the characteristic pulmonary lesions. Such an experiment has been described in the *American Review of Tuberculosis* by H. S. Willis.[2] Guinea-pigs were exposed to a concentrated atmosphere of silica in a dusting chamber for periods ranging from 24 to 37 months. The exposures lasted for about three hours each day, for four or five

[2] Amer. Rev. Tuberc., 1928, xvii., 253.

days a week, the animals being in the chamber for roughly 50 hours a month. Even after three years of this treatment the animals showed surprisingly few pulmonary lesions. Moreover, subcutaneous inoculation with tubercle bacilli was not followed by more rapid or extensive tuberculosis in these animals than in controls. Negative observations of the kind are familiar to workers in this field. It may be that the upper respiratory tract of animals which normally carry their noses so close to the earth are so constructed that the air reaching the pulmonary alveoli is efficiently filtered. Or it may be that the respiration of animals quiescent in the dusting chamber is abnormally shallow. Whatever the reason, it is clear that the experimental conditions do not represent those occurring in the dust industries. Negative results must not be regarded as disproving our present conceptions of the pathology of miners' phthisis, for the positive evidence available is far too abundant to be upset by what are clearly imperfect experiments. On the other hand, the prevention of pneumokoniosis in dangerous industries has steadily progressed in recent years. In a report [3] recently published by the Miners' Phthisis Medical Bureau of South Africa the measures taken for the detection and prevention of this disease are recorded in detail, and in an address [4] delivered by Dr. L. G. Irvine, chairman of the Bureau, the matter is discussed in more general terms. The work of the Bureau is well known, and we are glad to hear from Dr. Irvine that the present position is more satisfactory than for many years. Improved methods of diagnosis have resulted in the detection of many cases of silicosis in the earliest stages, which formerly would not have been recognised, and thus the apparent incidence of the disease has increased. In spite of this the latest recorded figures show less silicosis among the Rand miners than was to be expected from the experience of previous years. Silicosis and tuberculosis run closely together; the dust factor in the Rand mines has already been dealt with very effectively, and unceasing care is exercised to see that the atmospheric conditions underground are as good as they can possibly be. The control of tuberculosis underground, which practically means the detection of the "carrier," is also receiving the most careful attention, and it is not unreasonable to hope that the incidence of miners' phthisis will diminish still more in the future.

PRESCRIPTIONS FOR NASAL CATARRH.

DURING the recent wave of infectious colds over the American continent it is reported that persons who performed a nasal toilette in public were looked at askance and that a sneeze was tantamount to exclusion from a theatre. Nasal catarrh, however, is not an ailment for which many effective remedies have been discovered, and certainly very few are universally recognised. An Italian proverb states that a cold when left alone runs for 21 days and, when treated, for three weeks. Nevertheless there are certain procedures which, if applied early, can shorten matters. It is agreed that a cold may sometimes be nipped in the bud by a good sweat, induced by a cabinet, a hot bath, or a pile of blankets, assisted by an antipyretic. Prof. H. Beyer, who has given prolonged study to the prevention and treatment of *Schnupfen* in Berlin, has recently set out his experience [5] in a form which may be of use to others at the present time. At the outset, while there is still hope of aborting the cold, he recommends: calc. lact. 4·0, dionin 0·4, made up to 100·0 with half-and-half raspberry syrup and water, the whole amount to be taken in the course of the day. Mild anæsthetic sprays and the insertion in each nostril for an hour or two of a plug of cotton-wool steeped in 20 per cent. ichthyol solution, may also avert the attack. Prof. Beyer also mentions Brüning's local light bath, which is applied to the face while the patient, in a recumbent position, breathes through a glass tube. It raises the local temperature to about boiling-point without serious inconvenience, and avoids the disadvantages of a general application of heat. If these methods are unsuccessful, the patient should, he says, remain in bed, the swelling and secretion of the nasal area being treated with inhalants such as lysoform, or acid. carbol. liq., liq. alum. acet., of each 5·0, in 15·0 of rectified spirit and 10·0 of distilled water. Ten drops are placed on a piece of wadding and inhaled. Cocaine in minute doses affords relief, and the danger of mishap is negligible. A good nasal snuff is given as: coc. mur., menthol, of each 0·1 in 10·0 of milk sugar, and some firms market a composition of cocaine with menthol and adrenalin. Menthol, in a 0·2 per cent. solution with liquid paraffin, is said to be good, but must never be given to infants. In children the condition should be regarded with still more respect, as the obstruction may lead to suffocation, convulsions, or the inhaling of the tongue, and the infection itself may be serious in a weakly or predisposed child. Rubbing with wool soaked in equal parts of spirit and glycerine, and moistening the air with the steam of boiling water containing some menthol crystals are both useful measures. Fever should be treated with 1·5 of pyramidon once or twice a day, or in children over six months with half a tablet of aspirin. To mitigate breathlessness in sucklings at feeding time due to nasal swelling, a mixture of adrenalin 1–1000 one part, borated water two parts, may be dropped into the nose. Nose-bleeding during a cold in infants sometimes points to diphtheria or syphilis. Diphtheria carriers often suffer from an outbreak of their specific fever disguised as catarrh, in which purulent epistaxis replaces membrane building; loss of appetite, alimentary troubles, and dyspnœa from membrane soon betray the condition. The local application recommended is one also used as a routine prophylaxis for carriers—namely: protargol 3·0 dissolved in 5·0 of cold water and incorporated in lanolin 10·0, vaselin. flav. 30·0. The dangerous gangrenous form of nasal diphtheria is not common, but should be borne in mind as a reason for assiduous local treatment. Syphilitic colds break out a fortnight before the rash and differ from ordinary catarrh in a much more pronounced swelling of the nasal mucosa, which secretes large quantities of reddish-brown pus, which may flow down the nose and stain the face. When the ordinary treatment of catarrh fails it is worth while trying an ointment made up as follows: hydrarg. præcipit. alb. 0·2, lanolin 3·0, paraff. liq. 2·0. This should be applied to the nostrils once a day with a spatula. For sinus infection Dr. Beyer recommends the local light bath, along with a mixture containing pot. iod., sod. iod. of each 5·0 in aq. distill. 20·0; of this 5–10 drops are taken in milk three times a day. Saline douches, assisted by laxative mineral water to avoid hyperæmia of the mucosa, should be used in all catarrh; glycerine tampons left in place for half an hour and hydrogen peroxide douches will relieve the thick secretion and fœtor which follow ozæna, after which tampons soaked in eucupin 2·0 with aq. distill. 40·0 and lanol. ad. 100·0 are applied. Practitioners may find useful some of these prescriptions, which are throughout transcribed in metric form.

[3] Union of South Africa: Report upon the work of the Miners' Phthisis Medical Bureau for the year ended July 31st, 1927. Pretoria: Government Printing and Stationery Office. 1928. Pp. 61. 5*s.* 6*d.*

[4] Present Position of Miners' Phthisis on the Rand. An address to the Association of Mine Managers. By L. G. Irvine, M.D., B.Sc. (Obtainable from the Bureau.)

[5] Deut. Med. Wochens., 1928, liv., 512.

THE ARMY MEDICAL SERVICES.

SOME confusion has arisen following the announcement, in our issue of Dec. 15th, 1928 (p. 1262), concerning an Advisory Board and a Consultative Committee in connexion with the Army Medical Services. The establishment of an Army Medical Directorate Consultative Committee is quite independent of the reconstitution of the Army Medical Advisory Board. It will be remembered that after the war the members of the Board, at that time Lord Dawson, Sir Berkeley Moynihan, Sir Robert Jones, Sir Harold Stiles, Sir William Horrocks, and

the President of the Medical Board at the India Office (ex officio for Indian affairs), ceased to be paid but continued to give voluntary service. The Board met seldom during the succeeding years except to advise the Secretary of State on the appointment of Director-General, and in 1928 Sir Robert Jones and Sir Harold Stiles retired from its deliberations. It was then recognised that the terms of reference of the Board required amendment and that men in civilian consulting practice were unable to give up the time necessary to carry out all the duties which then devolved upon the Board. At the same time many other questions, such as the lack of candidates for the Royal Army Medical Corps, post-graduate instruction, and the future prospects of the Corps, were presenting themselves on which the Director-General wanted the constant advice and help of the civil profession. For these reasons it seemed desirable to establish a board or committee covering a wider sphere of the civil profession and with more members, so that the Director-General could have more frequent meetings with at any rate a proportion of the members. The Secretary of State therefore decided to retain the Army Medical Advisory Board of four civilian members to advise him on matters of policy vis-à-vis the civil profession, and to constitute a new committee to be called the Army Medical Directorate Consultative Committee, with the Director-General as chairman, to discuss matters of departmental rather than general interest. The members of this committee were chosen to cover as wide a field as possible and in particular to secure liaison with the medical schools. As we have already stated, they consist of Major-General H. B. Fawcus (vice-chairman), Prof. J. Barcroft, Lieut.-Colonel Sir Robert A. Bolam, Colonel Sir E. Farquhar Buzzard, Colonel T. R. Elliott, Captain J. Fraser, Colonel G. E. Gask, and Colonel A. E. Webb-Johnson, with Major C. M. Drew as secretary. Hygiene, pathology, and radiology are not represented on this Committee since there already exist strong advisory committees on these subjects. One of the most pressing needs of the Medical Services of the Army is an adequate supply of candidates and this will be one of the first matters to be discussed by the Committee. It is expected that visits will be paid to the military hospitals by members and that much valuable advice will be obtained. It is clear that the Board and the Committee are quite distinct from each other and have no interdependence. The Board acts in an advisory capacity to the Secretary of State, and the Committee to the Director-General of Army Medical Services and through him to the Adjutant-General and the Army Council.

DRUGS FOR INSURED PERSONS.

THE memorandum recently issued by the Medical Practitioners' Union seems to be founded on a misconception of the arrangement made between the Ministry of Health and the Retail Pharmacists' Union. For some time past in most if not all of the insurance areas analysis has shown that the cost of the actual drugs is less than the amount paid to the chemists for dispensing them. Now the sum of money allocated to the drug fund as part of medical benefit is a fixed quantity, and the arrangement with the chemists implies that in accepting the whole of this sum they are taking the risk of a loss or a surplus according to the amount required for the supply of medicine to the insured population for any year. As far as the year 1928 is concerned the chemists will probably receive the whole of the cost of the drugs plus their dispensing fees to within a small percentage of the full amount. To put it in a sentence, the chemists' bills are discounted on the payment for services rendered, but are paid in full as far as the cost of the drugs is concerned. It seems therefore hardly fair for the Union to say that the control of the drug fund has been "handed over by the Minister of Health to the Retail Pharmacists' Union," and the statement that "the amount of medicine for the insured is strictly conditioned by what is left over after a working profit is provided for the pharmacist" does not represent the facts of the case. The amount of medicine is conditioned solely by the clause in the Act of Parliament which guarantees proper and sufficient medicine for adequate treatment. What is proper and what is sufficient is determined and can only be determined by insurance practitioners themselves. Even in a case investigated under the regulations for alleged excessive prescribing the determination and decision are in the hands of the practitioner's colleagues on the local panel committee. It may be remarked that the attempt at restriction made by the London Insurance Committee recently has apparently been given up. The report of the last meeting of the London Panel Committee indicates a determination to leave the ordering of any remedy to the absolute discretion of the practitioners themselves. We commend the Union for its jealous watch over the interests of medical practice; in this matter, however, there seems no ground for anxiety.

ŒDEMA IN EXOPHTHALMIC GOITRE.

As long ago as 1897 Hector Mackenzie pointed out [1] that œdema may appear in several phases of Graves's disease. The illness may be heralded by a slight general œdema; during the course of the malady a very persistent local œdema may affect the eyelids; sometimes a curious swelling is met with in the lower extremities, resembling the swelling of myxœdema in being firm, non-pitting, and yielding no fluid on acupuncture; very occasionally puffy urticarial lesions are seen at the onset of severe cases. A solid infiltrated type of œdema is described as not uncommon in most English text-books. Œdema of cardiac origin is of course well known. A complete and erudite account of the whole subject has lately appeared [2] from the pen of Dr. Malte Ljungdahl, of Malmö, Sweden. The writer reviews the literature back to Mackenzie's article, mentioning Maude's original classification into Œdema of cardiac origin, Œdema of "nervous" origin (which would now be called "vasomotor"), and Patchy and fugitive types. He describes fully and clearly six cases of his own showing well-marked œdema and bases on these three types of œdema—namely: (*a*) œdema dependent on stasis and cardiac failure, especially failure of adequate diastolic filling; (*b*) œdema in circumscribed zones as described by Quincke; and (*c*) a firm, non-pitting œdematous infiltration of the skin in certain sites, notably the eyelids and the legs. The exact causation of the œdema under the two latter rubrics is not clear, but Dr. Ljungdahl suggests that it is part of the toxæmia of which hyperthyroidism is itself a manifestation. This view is supported by the fact that the lesions in type (*b*) may be indistinguishable from those of erythema multiforme. All three types of œdema may be prolonged, considerable and relapsing without prejudice to the prognosis—a fact on which the author lays much stress. Along with the œdema may appear icterus, scleroderma, or pigmentation as allied phenomena. In regard to treatment, Dr. Ljungdahl regards iodine as specific for all such œdematous states, and his charts illustrative of the diuretic effects of this drug are very striking. Three drops daily of Lugol's solution rapidly increased to 18 or more drops will resolve the œdema besides bringing about a general amelioration in the symptoms and a lowering of the metabolic rate. If icterus is present it also will yield to iodine. The value of iodine in Graves's disease has long been known; although its mode of action is still unsettled, it is frequently given as a preliminary to thyroidectomy. American experience was recently reviewed in these pages.[3] Dr. Ljungdahl's work is a welcome addition to our knowledge.

[1] Edin. Med. Jour., 1897, xliii., 401.
[2] Wien. Archiv. für Innere Medizin, 1928, xvi., 1.
[3] See THE LANCET, Jan. 5th, p. 57.

COUNTY HOSPITALS IN THE IRISH FREE STATE.

AT the meeting of the Council of the Irish Medical Association held last week attention was given to the present condition of many of the county hospitals, and the following resolution was passed :—

"The Council of the Irish Medical Association has had under consideration the unsatisfactory conditions under which the surgeons of many county hospitals are expected to do surgical work. In many cases there has been no structural alteration for generations, and in few is there adequate equipment. At the same time surgeons are pressed to undertake major surgery which cannot be done with due regard to the welfare of patients. The condition is such as to demand immediate attention."

When the public medical services of Ireland began to undergo reform some seven or eight years ago, it was an essential part of the scheme that there should be in each county a county hospital capable of dealing with the ordinary surgical work of the county. With this end in view, as vacancies occurred in the position of county hospital surgeon, superior surgical qualifications were demanded from those who sought appointment. It was assumed that the hospitals would be so equipped that surgical work should be done in accordance with modern requirements. In 1924, in its memorandum of evidence submitted to the Committees of Inquiry on National Health Insurance and the Medical Services, the Department of Local Government and Public Health stated that the necessary development had taken place, and that the hospitals were provided with the scientific equipment essential to the performance of their duties. Verbal evidence submitted later by the Department's officials failed to substantiate this claim, and even at the present day comparatively few of the county hospitals are equipped in such a way as to justify the performance of major surgical operations. At the same time the surgeons are criticised by their boards of health if they think fit to refer patients for major operations to the city hospitals. The surgeons have also another, and a more personal, grievance. Many of them, writes our Dublin correspondent, were appointed with a definite promise that provision would be made in the hospitals for the accommodation of private patients, who, in addition to paying for their accommodation, would pay fees to the surgeons. This promise affected the salaries accepted by the newly appointed surgeons. In few cases, however, has the promise been fulfilled and regulations adopted to govern the admission of private patients. The net result is that the health authorities, failing to fulfil the promise made, have obtained the surgeons at lower salaries than would have been accepted had the promise not been made.

THE VIRULENCE OF THE BLOOD IN TUBERCULOSIS.

AN interesting investigation into the virulence of the blood of tuberculous subjects has been performed on a large scale by Dr. R. Pla y Armengol.[1] He has confirmed by numerous experiments his discovery that blood taken from a guinea-pig 24 hours and onwards after the animal has been injected with caseous material or with tubercle bacilli is uniformly fatal to healthy guinea-pigs. Some die in a week, others after two or three months. Only in a very small percentage of cases do the guinea-pigs develop typical tuberculosis. In the rest no tubercles develop and no Koch's bacilli are found, but the animals show a progressive wasting. Details of autopsies are not supplied, but it is stated that the lymph glands are usually normal. The blood of 27 patients in whose sputum tubercle bacilli had been demonstrated was also regularly fatal to guinea-pigs. When the batch of animals into which this human blood was injected were just dead or dying, 2 c.cm. of blood from each of them was injected subcutaneously into other guinea-pigs, with uniformly fatal results. This passage was repeated three times in each case. Among the whole series of guinea-pigs, of which 675 were used in all, the injection was fatal in all but nine.

Dr. Armengol suggests that the experiments prove the constant presence in the blood of tuberculous animals of a living organism which is able to multiply in the body, and he believes this to be the tubercle bacillus in another form. This argument really turns on the fact that he failed to find Koch's bacilli or the usual lesions in the majority of the animals. It is admittedly sometimes a laborious task to demonstrate tubercle bacilli in lesions which are known to be tuberculous; there is rarely, however, any difficulty if the animal dies of the disease. Similar observations to those of Dr. Armengol have been made before, but the usual explanation given has been that of intercurrent or secondary infection. This Dr. Armengol rejects because of the regularity with which a fatal result occurs. The objection is reasonable, but his article would have had more value if he had supplied more information about control experiments. It is possible that we are dealing here with the filterable form of the tubercle bacillus (Fontes) whose existence has been supported by the work of Vaudremer, Valtis, Calmette, and others.

[1] Publicaciones del Instituto Ravetlat-Pla, Barcelona, October, 1928.

AT a meeting of representative dermatologists from Leeds, Liverpool, Manchester, and Sheffield held in Manchester on Jan. 15th, it was decided to expand the Manchester Dermatological Society into a North of England Dermatological Society. The Society, in addition to the annual general meeting, will hold four clinical meetings each year—one in Liverpool, one in Sheffield, and two in Manchester. The following officers were elected :—President: Dr. L. Savatard (Manchester); Vice-presidents: Dr. R. W. McKenna (Liverpool) and Dr. A. R. Hallam (Sheffield); Secretary: Dr. P. B. Mumford (Manchester); Members of Council: Dr. J. T. Ingram (Leeds), Dr. W. Dyson (Manchester), and Dr. G. H. Lancashire (Manchester). Any dermatologists, other than those already notified, in the North of England who would like to join, are asked to write to the Secretary, Dr. Mumford, 96, Mosley-street, Manchester.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments have been made:—Surg. Rear-Admirals: A. J. Hewitt to *Pembroke*, and H. C. Whiteside to *Victory*, for R.N. Hospital, Haslar; Surg. Lt. J. W. Nesbitt to *Pembroke*.

ROYAL ARMY MEDICAL CORPS.

Capts. to be Majs.: J. P. Macnamara, J. W. Hyatt (Prov.) and remains secd., T. Stanton, and T. Parr (Prov.) and remains secd.

Lt. (on prob.) J. C. Gilroy, from the secd. list, is restd. to the estabt.

ARMY DENTAL CORPS.

The undermentioned Lts. (on prob.) are confirmed in their rank: H. L. Foulkes-Roberts, T. R. Wall, J. A. O'Connor, and H. S. Golding.

ARMY RESERVE OF OFFICERS.

Lt.-Col. G. B. Crisp, having attained the age-limit of liability to recall, ceases to belong to the Res. of Off.

ROYAL AIR FORCE.

Flying Officers J. E. Foran and M. O'Regan are promoted to the rank of Flight Lt.

RESERVE OF AIR FORCE OFFICERS.

Flying Officer W. B. Stott relinquishes his commission on completion of service.

INDIAN MEDICAL SERVICE.

Lt.-Col. R. W. Anthony to be Maj.-Gen.
Capt. G. A. Hildreth to be Maj.
Lt.-Col. J. B. Christian retires.
Temp. Lt. Prag Nath Kapur relinquishes his temp. commn.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XIX.

THE INTERPRETATION OF BLOOD-SUGAR ESTIMATIONS.

THE presence of an adequate amount of sugar in the blood is essential for life and its many activities. Although the blood-sugar increases after a carbohydrate meal no sugar is excreted in the urine of most healthy people. The presence, therefore, of a reducing substance in the urine which has been proved to be dextrose should always arouse suspicion and an estimation of the blood-sugar should be made. Whether a glucose-tolerance test need be performed depends on the amount of sugar in the blood, as will be seen below.

Collection of Blood.

The time at which the blood should be collected is very important. If the examination is being made for the purpose of establishing a diagnosis when sugar has been found in the urine, the blood should be collected one to two hours after a meal at which at least 2 oz. of bread have been eaten. This is essential in the mild cases, since the blood-sugar may only be raised for a short time, and a wrong diagnosis has been made by collecting the blood some hours after the meal or after a period of strict dieting. If the case is a severe one, the blood-sugar will probably be raised throughout the day and the blood can therefore be collected at any time.

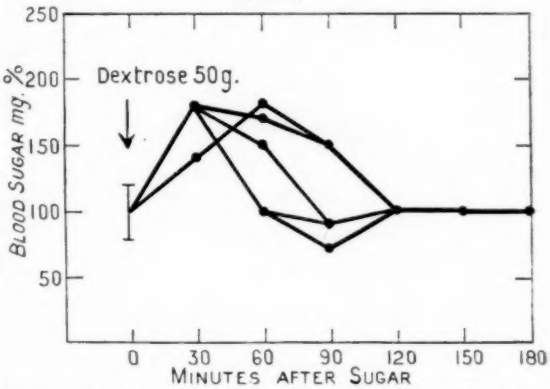
If the patient is having insulin, the blood must also be collected at a definite time. It should be collected (1) before the morning dose of insulin if it is desired to know whether the blood-sugar has been brought down to normal at the beginning of the day. If it is inconvenient to see the patient before breakfast, a carbohydrate-free meal should be eaten and the blood collected as soon as possible after it, and the insulin and usual carbohydrate given later. (2) The blood should be collected three to six hours after the insulin so as to make certain that the response to the insulin is the correct one. (3) It may be necessary to collect the blood again immediately before the evening dose of insulin. The information obtained at these three times gives the best indication of the reaction of the patient to insulin, though it must be admitted that it is possible to gauge the correct dose of insulin with very few blood-sugar estimations. After the dose of insulin and the diet have been stabilised, one of these times should be chosen, the blood for testing should be collected always at this time, so that the progress of the case can be assessed. If a gain or loss of sugar tolerance has occurred, it is sometimes of assistance to estimate blood-sugar at all three times in order to adjust the dose of insulin.

Collection of Blood.—The blood can either be collected from a vein by means of a sharp needle and syringe or from the capillaries of the ear-lobe or finger. If the finger is used, it is important to place the hand in hot water, so as to make certain that the skin is hot and contains plenty of blood. The best needle to use is the "blood gun" recommended by Prof. Herrmann Sahli. After the prick has been made a piece of fine rubber tubing should be wound round the base of the finger in order to make the blood flow more freely. If the blood has to be sent by post to the laboratory, 2 to 5 c.cm. should be collected from a vein. In order to prevent the clotting of the blood and the disappearance of the sugar, a mixture of potassium oxalate 4 parts and potassium fluoride 1 part must be added. For 5 c.cm. of blood, 0·02 g. of the mixture is sufficient: and this can be roughly measured on the point of a large pocket knife. The blood should be placed in a tube or bottle and then in a small tin to prevent any risk of breakage.

Normal Values.

To interpret the result of a blood-sugar estimation correctly the normal variations in the amount of sugar in the blood must be understood both in health and disease (see Fig. 1). When a healthy person has had no food for three or more hours the sugar in the blood varies from 80 to 120 mg. (0·08 to 0·12 g.) per 100 c.cm. [It is better to express the result in milligrammes—e.g., 95 per 100 c.cm. instead of as a decimal part of a gramme—e.g., 0·095 per 100 c.cm., because it is much easier to use a whole number and less likely to cause mistakes.] After a dose of 50 g. of dextrose taken by the mouth, or after a heavy carbohydrate meal, the blood-sugar increases rapidly, and may have begun to rise after 10 mins.; it usually reaches a maximum after 30 mins., and may have returned to the fasting value after 60 mins. The usually accepted maximum for capillary blood of a normal person after 50 g. of dextrose is 180 mg. per cent., but it may be only 150 mg. or even less. The maximum figure may not be reached until after 60 mins., and the return to the fasting value may not take place until after two to three hours. The actual figures depend on whether the blood comes from the capillaries or veins. The capillary blood is identical with that obtained from an artery. When the patient is fasting the two estimation are identical, but after the dose of sugar the capillary blood is usually 20 mg. higher than the venous blood. Only the figures for the capillary blood will be considered in this article.

FIG. 1.



Normal variations for capillary blood. (For venous blood the readings are 20–30 mg. lower.)

The Lag Curve.—A rare occurrence is a rise in the blood-sugar to 230 mg. after 30 minutes. Provided that the blood-sugar has fallen below 180 mg. after 60 minutes and below 130 mg. in 120 minutes, the sugar tolerance is regarded as normal, though it is advisable to repeat the test three months later.

Abnormal Values.

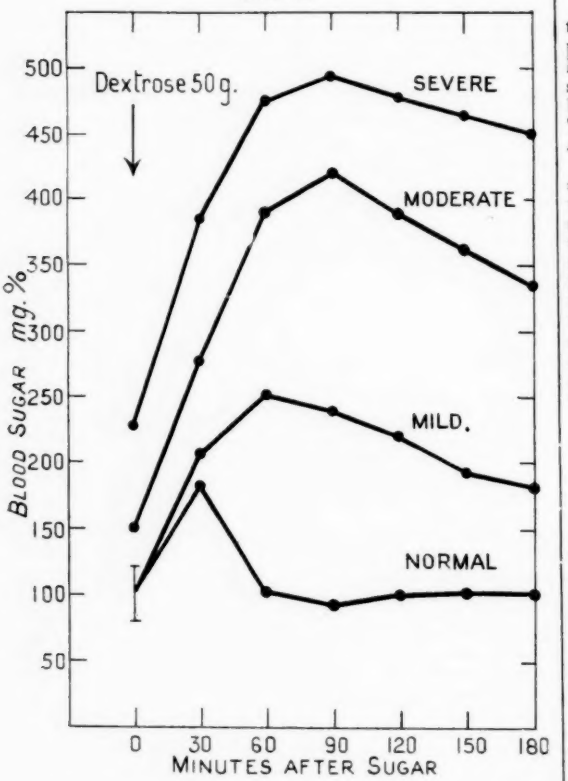
If a patient has a mild form (Fig. 2) of diabetes, the fasting value of the blood-sugar is often normal —i.e., below 130 mg. per cent.—but 30 mins. after 50 g. of dextrose it has usually risen above 200 mg. per cent. After 60 mins. it is usually still higher, and does not return to normal until more than three hours have elapsed. In a more severe case, the fasting value is often raised to 150 or 180 mg. per cent. and the blood-sugar may rise to more than 250 or 300 mg. per cent. after 30 mins. and over 400 mg. per cent. after 60 mins., and may not return to normal for several hours. If the initial value is over 200 mg. per cent. the blood-sugar may rise to more

than 500 mg. after 60 mins. A sugar-tolerance test should never have been asked for if the initial blood-sugar was over 200 mg. per cent., since this alone would show that the patient had a low sugar tolerance.

If an isolated determination of the blood-sugar is made, it is essential to know the nature and time of the last meal and whether the blood was collected from the capillaries or a vein.

If the blood-sugar is over 200 mg. per cent. 60 mins. after the last meal it is certain that the patient has a low sugar tolerance. If it is 180 mg. per cent.

FIG. 2.



one hour after a meal in which carbohydrates have been eaten, it is only suspicious, but if it stands at this figure two hours after the meal, the patient probably has a low sugar tolerance; but in order to prove it definitely the tolerance must be tested with a 50 g. dose of dextrose. If, however, the blood-sugar is 180 mg. per cent. three hours after a meal, the patient certainly has a low sugar tolerance.

It should be remembered that although the blood-sugar of a normal individual is not raised above 180 mg. per cent. after meals, it is sometimes raised above 200 mg. in moments of excitement and nervous strain when glycosuria may occur. It is also sometimes altered in certain diseases. Thus a severe carbuncle or numerous boils may cause a rise in the blood-sugar and sugar may even appear in the urine, although the sugar tolerance, both before and after the illness, is apparently quite normal. Such an observation should, however, raise the suspicion that the sugar tolerance is rather lower than that of most individuals. When the patient has a definitely lowered sugar tolerance, especially if it is sufficiently low to need insulin to keep the blood-sugar within normal limits, any infection may cause a rise in the blood-sugar and the presence of sugar in the urine. A severe infection may precipitate the onset of coma. Diseases of the thyroid gland, like exophthalmic goitre and myxœdema, may cause a lowering of the sugar tolerance, and in these conditions the sugar-tolerance curve may show a rise above 200 mg. after 30 mins. and the return below 200 mg. may be delayed for two or more hours. The blood-sugar of a healthy person may be lowered in extreme exhaustion—e.g., during a Marathon race or after an excitement is over. Moderate exercise may cause hypoglycæmia in patients who are having insulin, and it is more likely to occur three to six hours after the injection of insulin. They should be warned of this complication.

Relation of Glycosuria to Glycæmia.

Sugar is not detected in the urine by the ordinary tests unless the blood-sugar rises above 180 mg. per cent. This level is termed the threshold of the kidney. It may be raised or lowered. If it is raised, sugar may not appear in the urine even though the blood contains 250 or 300 mg. per cent. of sugar. The correct diagnosis can only be made by means of an estimation of the blood-sugar.

If the threshold is lowered the patient passes sugar in the urine although the blood-sugar lies within the normal limits. If it is only slightly lowered, say to 150 mg. per cent., sugar will appear in the urine after a carbohydrate meal, and suggest that the patient has a mild form of diabetes. If the threshold is below 100 mg. per cent. sugar will be present in the urine throughout the day, and will suggest that the patient has a severe form of diabetes. The diagnosis is suggested by the absence of the usual symptoms of thirst and polyuria, but can only be made with certainty by means of a sugar-tolerance test after 50 g. of dextrose.

GEORGE GRAHAM, M.D. Camb., F.R.C.P. Lond.,
Assistant Physician, St. Bartholomew's Hospital.

DONATIONS AND BEQUESTS.—Mr. James Mills Travis, Springhead, Saddleworth, Yorks, left £1000 to the Oldham Royal Infirmary for a bed.—Miners and other workmen in the Wigan district contributed £16,515 last year to Wigan Infirmary in voluntary weekly levies.—Mr. John Davison Bland, J.P., of Kippax Park, Yorks, and Torquay, left, besides other bequests, £4000 to the Leeds General Infirmary, £2000 to the Leeds Public Dispensary, £1000 each to the Leeds Women's and Children's Hospital, Leeds Maternity Hospital, St. Anne's Home, Bridlington, and the Queen's Hospital for Children, Hackney, London.—Miss Henrietta Fell, of Westbourne-grove, Scarborough, besides other bequests, left £1000 to Scarborough Hospital and the residue of her property, about £30,000, to the Birkenhead Hospital.—Mr. Isaac Dymmock, of Redland, Bristol, left £1500 to Bristol Royal Infirmary to endow a bed to be called the "Isaac Dymmock bed."—Mr. and Mrs. Joseph Smith, of Holmfield-road, Leicester, have given £500 to the Leicester Royal Infirmary for the endowment of a bed to mark the celebration of their golden wedding.—Mr. John O'Connor, K.C., of Frognal-mansions, Hampstead, London, N.W., besides other bequests, left £2000 to the Cancer Hospital, Fulham, "in grateful remembrance of services once rendered to a dear relation."—Mr. Joseph Batty, Whitchurch, left £1000 to the Cardiff Infirmary and to King Edward VII. Memorial.—Mr. Charles Stones Gray, of Rozel, Ryde, retired dental surgeon, left £1000 to St. Dunstan's Hostel, £300 to George Muller's Orphanage, Bristol, and £200 to Dr. Barnardo's Homes.—Mr. Walter Samuel Baines, Folkestone, Kent, on the decease of his wife, left £5000 to the Sutton (Surrey) Hospital, and after further bequests the balance to Dr. Barnardo's Homes, whom failing to King Edward's Hospital Fund.—Mr. Arthur Henry Foster, Green-lane, Moseley, Birmingham, solicitor, amongst other bequests, left £1000 each to the Birmingham General Hospital, the Queen's Hospital, Birmingham, the Birmingham and the Midland Homœopathic Hospital; £200 each to the Birmingham and Midland Ear and Throat Hospital, the Birmingham Royal Institution for the Blind, and the Birmingham General Dispensary; and a sum sufficient to endow a bed or cot to the Children's Hospital, Birmingham.—Subject to certain annuities, Mr. Haywood Smith, of Penwellyn, Sidcup, who left £47,259, bequeathed the whole of his estate to the Sidcup Cottage Hospital and the Chislehurst, Orpington, and Cray Valley Hospital.—Mr. Charles Courtenay Cowlin, of Somerset, left, among other bequests, £1000 to the Bristol General Hospital.

Special Articles.

THE STUDY OF INDUSTRIAL HYGIENE.

By M. GREENWOOD, D.Sc., F.R.S., F.R.C.P. Lond.,

PROFESSOR OF EPIDEMIOLOGY AND VITAL STATISTICS IN THE UNIVERSITY OF LONDON (LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE).

EVERYONE knows that, since the war, the study of industrial hygiene and medicine has entered upon a new phase. Before 1918 research was largely a by-product of the official duties of civil servants or done in the leisure of busy physicians and surgeons; since 1918, not only have many trained investigators specialised in industrial-medical research, but the appointment of whole-time medical officers by employers of labour is no longer very exceptional. Contemporaneously with this increase of skilled observers—in part, of course, its cause—has been a growth of demand for information from all classes; various national and international organisations seek to supply this demand and, as will appear later, the quality of the supply varies. Comparing what we have learned in the last ten years with what was known before, anybody not familiar with the history of scientific progress is likely to be disappointed. He *must* feel this, if his criterion be the number of practically important discoveries made, for these have been few and unspectacular.

Those really familiar with the methods of science will not, however, be discouraged. They will be satisfied if it can be shown that the *methods* of research now coming into use are more powerful than those of a generation ago and will not expect a few years' use of even powerful new methods to yield results more valuable than that which the patient observation of such men—to cite only our countrymen—as Thackrah, Greenhow, Whitelegge, Oliver, Legge, and Collis has furnished in a century. The work of the last ten years has been primarily important in methodology and—as *always* happens when we enter upon a fruitful line of research—we have learned that apparently unrelated problems, each seemingly capable of solution by an ad hoc method, are really interrelated. Serious investigators have become more conscious of their own ignorance and less willing to lay down general laws. The history of almost any of the researches of the Industrial Fatigue Research Board illustrates this. I choose, as an example, one in which I have had a small personal share—viz., the study of the ætiology and prevention of industrial accidents. The long and, on the whole, creditable history of measures taken to reduce the risk to life and limb in factories in this country is well known. It is equally well known that of the accidents now occurring only a small proportion could be prevented by action beyond the control of the worker. It has been authoritatively stated that "however well machinery is guarded we cannot look for more than 10 per cent. reduction in the accident rate by the provision of safeguards alone."[1] In other words, the greatest proportion of industrial accidents is due to factors other than those which can be eliminated by administrative or mechanical betterment.

This leads us to look at the problem from another angle. Let us suppose that we have a record of this kind: A number of people all doing the same work under the same environment have been observed for the same time, and we are told that so many had no accidents, so many had one accident, so many two accidents, &c. Can we from the *form* of this distribution learn anything about the causation of the accidents? We can put our imagination to work, invent explanations and then test them. There are three hypotheses which have occurred to most people. The first is that accidents really are a matter of luck, in which the quality of the victim goes for nothing. The case is supposed to be like that of tossing true coins; whether a coin shall fall head or tail depends upon a great many factors which, however, do not favour any one coin more than any other. The second obvious hypothesis is that, although before any accident has happened those exposed to risk are all alike, the having an accident differentiates the group so that those who have had one accident are more—*or* less—likely to have a second accident than those who have had none are likely to have a first accident. The third hypothesis is that, *ab initio*, the liability to accident varies from person to person. Each hypothesis must have occurred to any intelligent person. A step forward was taken when it was found that each hypothesis could be expressed algebraically and that the algebraical forms led to an arithmetical criterion of the probabilities of the several hypotheses. Mr. Udny Yule and I reached an approximate solution of this problem in 1919,[2 3] and our work has since been greatly improved and generalised by Miss E. M. Newbold,[4] whose admirable memoir was recently awarded the Guy Medal of the Royal Statistical Society.

A New Instrument of Research.

The approximate solution of the theoretical problem put into our hands a new instrument of research. The next step was to obtain adequate data for testing. This was a very difficult task and has occupied much of the time of several investigators for years.[5] Incidentally, it has led to great improvements in the keeping of accident records and has been of some little service to employers of labour in bringing to their notice the importance, in terms of efficiency, of individually trivial occurrences. So far as the original problem is concerned, it has been established that, while it is certainly not possible to draw hard-and-fast lines in ætiology, the third hypothesis—viz., that individual susceptibility is of primary importance—is the one most satisfactorily accounting for the facts. It further appeared that those peculiarly susceptible to minor accidents were also, on the whole, more prone to minor illnesses. Having reached the conclusion that proneness to accident tends to be an individual peculiarity, the next point was to ascertain whether this character were correlated with some other physiological or psychological character which could be independently measured. If so, it might be possible, *before* exposure to risk, to say who were likely to be dangers to themselves or others. Here, too, progress has been made, particularly by Farmer and Chambers.[6] They applied various physiological and psycho-physiological tests to a large number of subjects and found, in their final weighted results, a difference of 48 per cent. in the accident rate between those above and those below the averages in the tests. These researches are still in their infancy; no tests yet used have shown a sufficiently high association with the elusive quality—or group of qualities—determining accident-liability to be of much practical use in vocational selection. But the future is promising. Work on other lines, developing from the Board's investigation of telegraphists' cramp,[7] has also brought us to the conviction of the need to assess the psychological make-up of the worker, to seek to *measure* it. The accident problem has thus fallen into its place in the general scheme of seeking to measure all things, not only the lighting and heating of the factory, not only the output of the worker, but his personality. Speaking as a statistician, I should say that ten years rather close association with this work has not indeed shaken my natural faith in the value of the statistical instrument, but has convinced me that, while the statistician can nearly always be a useful critic, he can only do useful research work as one of a team, neither the master nor the servant of his colleagues. Those having expert knowledge of industrial conditions may blunder in statistical logic, those skilled in statistical methods may misapply them for lack of practical knowledge of the material used. This was quickly

realised in England, and the investigations of the Industrial Fatigue Research Board have always been coöperative. Often a special committee has been appointed, upon which clinicians, physiologists, statisticians, employers, and employed have met upon equal terms, and *always* a research report has had to run the gauntlet of criticism by the different experts mentioned. Of the value of this system in bringing about mutual understanding of methods and points of view I shall not speak; but one result I must notice for it is relevant to my theme. Intimate contact with those actually engaged, whether as employers or employed, in industry or commerce, has made us—if I may be permitted to reckon myself as an investigator—very reluctant to draw general conclusions or to lay down the law for any industry *as a whole*. A third year student can classify "cases" but a practitioner must treat *patients;* the investigator of industrial conditions discovers that even within a highly specialised craft the same verbal description covers disparate conditions. When the craft is not highly organised, this difficulty of being sure that what one has observed is really representative of the "universe of discourse" is still greater; yet it is just in these industries that knowledge is most needed.

Application to the Laundry Trade.

A good example is provided by Miss May Smith's "Studies in Laundry Trade." [8] One is dealing with a very important occupation employing a large number of people, but the conditions of employment are almost infinitely variable.

> "Only one generalisation seems to be warranted with regard to the laundry trade as a whole—namely, that if a factory calls itself a laundry, then its main occupation is washing soiled linen and clothes. Nothing else can be taken for granted. The building may vary from a modern specially designed laundry with the latest machinery, ventilation appliances, rest and mess-rooms, to a converted house, shop, or stable, where all reconstruction has to be modified by the exigencies of the original building and where there is little or no room for expansion or modern requirements; between these two extremes there is every grade of adequate or inadequate building. Proprietors and managers, like the buildings, represent practically every social class and type of education and ability, and while we cannot say quite as much with regard to the workers, still in many laundries there exist side by side relics of the old washerwoman of a previous generation with the latest product of high-class factory girl. Turning to plant, the same diversity prevails; on the one hand is the firm anxiously distrustful of the effects of machinery on clothes and wishful to do as much of every process by hand as is compatible with its conditions, while on the other hand is the firm that eagerly tries every new appliance and scraps any machine that can be superseded by a better."

In these circumstances the research worker must first seek to discover whether the occupation when followed under reasonably good environmental conditions is inherently detrimental to health and fitness. Miss Smith took this course; her actual studies were made, for the most part, in reasonably well-equipped laundries, and there she was able to demonstrate large individual variations of efficiency and to show how improvement might be effected. Her measurements of atmospheric conditions covered a wider range of factory types, and in this matter—since the method, that of Dr. Leonard Hill, had been used in other industries—some comparisons were possible. It appeared that the atmospheric conditions of laundries compared unfavourably with those of some other industries—for instance, boot and shoe shops; the cooling powers were usually inadequate.

No General Conclusions Justified.

One would naturally wish to correlate these latter results with measures of sickness incidence, but for this adequate data were lacking. All Miss Smith was able to do was to obtain returns from 23 firms of time lost through three winter and three summer months. The data related to only 1144 workers, and all that can be said is that the percentage of time lost owing to illness—which varied from 1·0 to 1·8 per cent. of the total possible working hours—is certainly not greater than in occupations usually supposed to be healthy.

This research seems to me a good example of the method one should adopt in such cases. Some not unimportant discoveries have been made, means of minor improvements are suggested, and a further contribution is made to the knowledge of the general psychological factors of industrial efficiency. But neither the author in her text nor the Industrial Fatigue Research Board in their preface felt justified in generalising the results to cover the trade as a whole. I have quoted what seem to me convincing reasons in favour of this reticence. It might be added that it is not yet possible—it may never be possible—to compile uniform morbidity records having the *workplace* as the unit of classification for such an industry. Indeed, even when we have had to deal with highly organised and localised crafts, such as the textile trades, the compilation and standardisation of such records has been a costly and difficult undertaking. At present we really know nothing of current sickness rates in the laundry trade in England and Wales. One seems, therefore, forced to conclude that we do not know enough about the subject to draw *any* general conclusions, and so turns with a certain curiosity to an essay upon laundries recently issued by the International Labour Office. It might be that, at Geneva, data based upon continental experience had been assembled which had escaped the notice of the Industrial Fatigue Research Board.

A Geneva Brochure.

The International Labour Office's "brochure" on laundries forms No. 127 [9] of a series under the general title Occupation and Health, having the subtitle Encyclopædia of Hygiene, Pathology, and Social Welfare, Studied from the Point of View of Labour, Industry, and Trades. The cover records the names of an imposing list of expert collaborators, but this particular "brochure" (an article of six pages) carries the footnote: "According to an original report by Dr. L. Carozzi (I.L.O.), revised by the Correspondence Committee on Industrial Hygiene of the International Labour Office," which may perhaps mean that Dr. Carozzi, rather than the expert collaborators, should have the credit. The same footnote is attached to a "brochure" (four pages) upon Candles (Manufacture of) so that Dr. Carozzi's energies cover a wide industrial field.

The "brochure" opens quietly with some linguistic information and a warning that "there is an exceedingly wide range of method followed in this industry," while a paragraph headed "Dangers-Pathology," begins with the caution that "it is difficult to gauge accurately the effect of this industry on the health, since most of the diseases to which their occupation renders laundry workers liable are such as might equally well proceed from other causes. Certain investigations and statistical enquiries have shown health conditions in this industry to be in general satisfactory as compared with other industrial work." The syntax may be doubtful and we may regret that the investigations and statistical inquiries are not more closely specified, still this exordium hardly prepares us for the grisly catalogue which follows. It seems that the work and conditions of laundries "undoubtedly provoke and aggravate certain forms of disease." Varicose veins are easily developed, ulceration and flat-foot are common evils, while "the working of a foot-pedal, shaking and wringing linen, &c., are apt to exercise a bad effect on the genital organs." Eczemas and skin eruptions are common. Nails are loosened by "daily work in alkaline solutions," mycosis of "the external canal of the ear, due to *Aspergillus nigricans* or *flavescens*" may cause "marked irritation." Again, "affections of the upper respiratory passages are to be ascribed to steam and to the alkaline fumes present, which dry the throat, give rise to thirst, and often lead to habits of intemperance." This disquieting information is drawn from uncharted wells of truth known to Dr. Carozzi. Upon the subject of tuberculosis we

have a little more detail. We are first told of an authority who asserts that "tuberculosis is very widespread in this industry" and that "incipent forms of it are not uncommonly diagnosed and treated as anæmia."

The same authority, evidently a man of original mind whose name should have been disclosed, has actually drawn attention to "the part played by heredity and infection" and helpfully suggested that "many of the victims are widows of consumptive husbands forced to take up the work in question in support of themselves and their families." This is interesting but perhaps a little inconclusive, and Dr. Carozzi, rightly, felt that some statistical verification would be expected—not of the particular fact about the widows of consumptives, which is clearly a stroke of individual genius, but of the general fact that tuberculosis is exceptionally prevalent amongst laundry workers. For England we are provided with a table introduced by these words: "The following table shows the prevalence among workers in this industry of ulcers on the legs and pulmonary tuberculosis as compared with other women workers, the records being those of two infirmaries in *England*."

I reproduce the information contained in the first two lines of the table. We are told that in the first infirmary in the year 1899 (information is confined to 1899 and 1900) the "number of workers" consisted of 247 laundresses and 1171 other workers, 36 of the former and 50 of the latter had ulcerated legs, percentages of 1·5 and 4·3, 21 of the former and 63 of the latter had pulmonary tuberculosis, percentages of 8·5 and 5·3. In the next year the percentage of laundresses with ulcerated legs rose to 13·6, but that of other workers sank to 3·6.

This table and its description neatly illustrate some elementary mistakes. Dr. Carozzi either does not know that north and south of the Trent the word infirmary has a different meaning or supposes that the difference does not matter. If his infirmaries were *poor-law* infirmaries, *solvuntur tabulæ risû*. The highly selected sample of the sick cared for in parish infirmaries is not in respect of occupation, age distribution, or ailment typical of the working-class population. Even if the infirmaries were really hospitals, the select character of the hospital population would still invalidate the generalisation of the results. When it is further noted that the data are nearly 30 years old, that the age distributions are not given, and that percentages are based once upon six and three times upon seven cases, the reader will agree that this is indeed strange evidence to be circulated by an international organisation.

Dr. Carozzi cites other statistical evidence of less dubious origin and, in doing so, makes it clear that he is unfamiliar with medico-statistical methods. Thus he writes that "In the United States the mortality-rate for tuberculosis is only 16·3 per cent. for both sexes." This being a rate of mortality about equal to that of London in the year of the Great Plague, one might suspect a misprint, but the juxta position of a table of *proportional* mortality (the entries in which, if correct, would give a proportional mortality, for ages 25–65, from tuberculosis of between 16 and 17 per cent.) suggests that Dr. Carozzi does not mean *rate of mortality* at all, but *proportional mortality*. This follows also from his citation of Bezançon. According to Dr. Carozzi, Bezançon found that amongst laundry workers 26 to 30 per cent. of the general mortality was due to tuberculosis, a finding which, Dr. Carozzi supposes, warrants the statement that "the tuberculosis mortality is high." As the age distribution of the decedents is not given, it warrants no such statement. It would be a high proportion if the age constitution of those exposed to risk were that of the general population; it would be a low proportion if they consisted mainly of young women. For instance, in England and Wales in 1927, 89,987 women died between the ages of 15 and 65 years, of these 14,049, or 15·6 per cent., of tuberculosis. Between the ages of 15 and 45 years 34,845 died, 11,188, or 32·1 per cent., of tuberculosis. Proportional mortality figures have little value unless the age distribution is provided. *A fortiori*, to compare the unstandardised proportional mortality figure of a particular disease based upon one occupation with that from another occupation is wrong. Even when the age distributions are similar, the proportional mortality of a disease may increase although the rate of mortality decreases in passing from one occupational or social group to another. For instance, in the Registrar-General's evaluation of occupational mortality for 1921–23, 35 per cent. of the deaths in the age-group 25–35 in Social Class II. were attributed to phthisis; in the lowest Social Class V. 32·4 per cent. were so attributed. But the death-rate from phthisis was 161 per 100,000 living in this age-group in Social Class V., 132 per 100,000 in Social Class II. There is, of course, no inherent reason why the two indices should move together. Actually, when we confine ourselves to occupations of the same economic grading, they tend to do so, and the proportional mortality figure may, *faute de mieux*, be a useful pointer to the existence of special conditions. Even when different economic groups are compared, there is usually an increase of proportional mortality from tuberculosis as one descends the social scale and also an increase of mortality-rate. As Collis and I pointed out,[19] the proportional index is really of some value if used discreetly. As used by Dr. Carozzi it is worthless; he has not made it even faintly probable that *any* class of laundry workers suffers more from tuberculosis than the general population.

An Important Principle at Stake.

If this is the character of the sections of the "brochure" where statistical justification is attempted, it is surely needless to pillory *obiter dicta* of writers cited without any statistical justification. Indeed, the reader may well ask why I direct attention to this compilation at all. In fact these obvious defects make the article less dangerous than it might have been. With a little more literary skill and a little better staff work at Geneva, the blunders which have, I hope, amused the reader would never have reached the printer; but the "brochure" would have been as essentially unscientific as it is now. Indeed, an important principle is at stake. Anybody who has served in an official department knows how great is the temptation—often the result of pressure from without—to undertake "authoritative" expositions of scientific questions. It is not pleasant for an individual, it is still less pleasant for a department to admit that guidance cannot be given upon a subject of practical importance for lack of knowledge. But in a department charged with administrative duties, those responsible know that the scorn of journalists is easier to bear than the troubles which would be created by ill-grounded generalisations leading to a demand for action. One cannot easily picture the permanent head of a British Ministry who would give an *imprimatur* to such a report as Dr. Carozzi's. The cost of typing letters to indignant proprietors of laundries and of re-glazing windows broken in Whitehall by intemperate employees would be too heavy.

But the direct administrative responsibilities of the International Labour Office are not so harassing. Besides, few of the laundering widows of consumptives, or the victims of enteroptosis (a "prevalent" affection), cardialgia, kidney trouble, ptosis, retro- or ante-flexion of the uterus, dysmenorrhœa, hysteria, and anæmia (which are "common" effects) would be well enough, after the long and expensive journey to Geneva, to break the windows of the International Labour Office.

Hence there is a strong temptation to the staff of the International Labour Office to be voluminous and encyclopædic in their publications. But the temptation should be resisted or intelligent employers and employees will conclude that industrial hygiene as expounded by members of our profession is really only a poor kind of journalism. There are some branches

of applied medical science wherein the methods of research have been standardised for a sufficient length of time for it to be possible for an able medical official sitting in a library to prepare a useful summary of methods and results. Of very few subdivisions of industrial hygiene is this yet true; we need more careful field investigations, not compilations of *obiter dicta*.

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SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Scottish Hospitals under the New Bills.

Major Walter Elliot, Parliamentary Under Secretary of State for Scotland, along with the officials of the Department of Health, met the Voluntary Hospital Liaison Committee a few days ago. This committee, it will be remembered, was appointed some months ago on the suggestion of the Secretary of State, to act as a liaison between the department and the voluntary hospitals. The meeting examined the position under the new Bill, and considered suggestions. It was unanimously agreed by the Liaison Committee that the poor-law stigma should be removed from hospital treatment, and that, therefore, the public bodies should have the necessary powers to provide hospital treatment apart from the poor-law. It was essential, however, that full and adequate safeguards should be made to protect the voluntary system, and the attention of the meeting was mainly directed to finding a form of words to achieve this purpose. The departmental representatives and the Liaison Committee decided to draw up a form of words that would give the necessary powers while safeguarding the position of the voluntary hospitals. Another meeting was to be held shortly.

Now that the Aberdeen experiment is under way there ought to be no great difficulty in adjusting a form of words that will meet all interests. The voluntary hospitals are anxious to coöperate in every practicable way with the local authorities and the Secretary of State. The recent experience of Glasgow in connexion with pneumonia and influenzal pneumonia had made manifest to the voluntary hospital authorities how important it is to maintain a good understanding with the public bodies. This will become even more manifest when the health authority is the "predominant partner" in the management of all sickness, but particularly sickness attributed to any form of infection. The experiment made with Stobhill by the poor-law authorities of Glasgow has paved the way for the all-round coöperation of the Glasgow hospitals. A similar movement is proceeding in Edinburgh. It is generally expected that all difficulties will disappear.

The Juvenile Delinquent.

In the circulars issued by the Scottish Office for magistrates and justices regarding the reports of the Departmental Committee on the Protection and Training and on Sexual Offences against Children, prominence is given to the necessity for careful medical examination of the juvenile and the juvenile-adult delinquents. The intention is to secure that any form of mental defect shall not be treated as mere criminality. It is laid down that the medical examiner selected by the juvenile court should, if possible, be one who has special qualifications for this class of work, and it is desirable that he should have some special experience in dealing with defective children or young persons. In most cases services of school medical officers will be readily available for this purpose. It is well that this point is emphasised, because, among recent developments, the non-medical psychologist has tended to become the dominant power. But it is well known that in many forms of mental defect, the psychological condition is merely a symptom either of imperfect physical development or of the positive presence of disease in glands or other hormonic structures. When education alone is in question, the lay psychologist has a large part to play, and the majority of delinquents demand the services of both types of expert.

The Scottish Education Department has issued a special circular on the report of the Committee on Sexual Offences. Mr. McKechnie, the new Secretary of the Scottish Education Department, was himself a member of that Committee, and, as one might expect, the circular gives evidence of an intimate and comprehensive knowledge of the problems. Mr. McKechnie lays great stress on the moral health of the children, and places character building among the primary duties of the education authority. He urges the importance of establishing social contacts of every desirable kind—for example, definite Church connexion, organised play centres, and playing-fields. In particular the department's circular suggests that the names "reformatory" and "industrial" shall be dropped from the description of schools. Although this cannot at present be done without an amended legislation, the department will henceforward call these schools training schools or have them known by a distinctive name. Also, it is suggested that as far as possible the children should attend the ordinary day schools in the district. Stress is laid on the need for recreation amenities and freedom, and above all for constructive education.

In connexion with the delinquent there is one important point—that the medical and school records should be available for the use of the court and that the education authorities should be willing to furnish these. These two circulars now formally bring the treatment of the juvenile delinquent on to a better administrative plane. They deserve the closest study by everyone concerned with this difficult group of problems.

The Influenza Epidemic in Glasgow.

The outbreak of influenza in Glasgow has been relatively sudden; there was nothing in the December figures to give warning of its approach. In fact, according to Dr. MacGregor's bulletin, the death-rate of 13·1 per 1000 in that month was remarkably low for the season; last December it was 18·7. Indeed, the 1928 death-rate as a whole was low—viz., 13·7, the same as the two lowest recorded years 1922 and 1927. Nor were the December pneumonia deaths exceptional, being 197 as against 298 for 1927; the other respiratory deaths being 94 as against 152. The epidemic was not preceded by any calculably greater prevalence of such simpler respiratory affections as acute tonsillitis. Reports of cases came in rapidly during the later days of a rather dense and continuous fog, which was followed by dull and cold weather, with mist at certain parts of the day. Other parts of Scotland were affected in more or less the same way, but Glasgow fogs are usually more severe. Fog and low temperature together, coming at the same time as the influenza, have greatly increased the incidence of acute pneumonia as a complication. Unlike the serious outbreak in the first quarter of 1927, this outbreak is not characterised by any peculiar virulence of the influenza itself; the symptoms are catarrh of the

upper respiratory passages, with moderate fever, lasting from three to five days, with the usual headache, general pains, malaise, and slow convalescence. There has been a good deal of laryngitis. The increase in the death-rate is due to the acute pneumonia accompanying or following the actual attack of influenza. The influenza epidemic began in the week ending Jan. 5th, when the general death-rate was 19·15 per 1000. In the week following it rose to 31·2 and 43·2, much as in March and April of last year. The actual deaths for these three weeks were: influenza, 14, 49, 149; bronchitis, 39, 73, 114; pneumonia, 59, 118, 187; other respiratory diseases, 4, 13, 14; total deaths, 116, 253, 464. The age-incidence is striking; children under 5 have suffered most from the respiratory group (excluding influenza). Thus, while the under-5 deaths from influenza were only 1, 0, and 15 in the three weeks, the figures for pneumonia and bronchitis together were 24, 62, and 107, with only one under-5 death from other respiratory forms. It should be added that "pneumonia" probably covers lobar consolidation, congestion of the bases, bronchitis and heart disease (especially in the old), and broncho-pneumonia. Some 600 to 700 beds are in use for pneumonia and the like in the municipal hospitals and no doubt, as formerly, further beds will be made available.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

The General Death-rate.

THE death-rate for the year 1927 has just been reported by the Chamber of Commerce to be 11·4 per 1000 living. This compares favourably with the rate of 12·2 for the year 1926. All but five of the 41 States in the registration area showed some fall in their rates. Those showing increases are all young States, in which the age-constitution of the population is probably not yet stable, and the first three are also the resorts of invalids. The States in question are Arizona, California, Colorado, Oregon, and Wyoming.

Deaths from Snake-bite.

During the past year 570 cases of snake-bite have been reported to the Antivenin Institute of America in Philadelphia. Of these 401 received serum, of whom 11 died. Among the remaining 169 there were 16 deaths. Copperheads were responsible for the largest number of bites, 159 being reported from 21 States between April and November. The cotton-mouth moccasin bit 38, the pygmy or ground-rattler 171, and the massasagua or swamp-rattler 2. Of the true rattlesnakes (genus Crotalus) the Texas diamond-back bit 95, the timber rattlesnake 40, the prairie rattlesnake 38, Pacific 27, Eastern diamond-back 11, and sidewinder 4.

Influenza.

The public health service estimates that there were one and a quarter million new cases of influenza in the week ended Dec. 22nd. The disease has been very general this winter, though not particularly fatal. A definite epidemic was noted on the California coast in the second half of November. It appears to have spread rather slowly, until it has now reached the Eastern sea-board. In some sections children and young adults are said to be chiefly affected, in others people of middle age. It is probable that many more cases occur than are reported and that, if all cases were known, no age-group would be found to have escaped. Surgeon-General Cumming speaks of the possibility of a second epidemic wave with higher fatality.

Prof. John J. Abel and Dr. H. Jensen, of Johns Hopkins Hospital, announce that they have isolated the active principle of insulin in the form of a crystalline protein of relatively simple composition.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

The Health of the People.

SOME idea of India's vast public health problems may be obtained from the report for 1926 of the Public Health Commissioner with the Government of India which has just come to hand. India's death-rate in 1926 was 2½ times that of England and Wales, her infant mortality-rate 2⅝ times. In India the expectation of life at 5 is approximately 35 years, and at 20 is about 27, as against 54 and 41 respectively in Great Britain. Generally it may be accepted that an Indian's expectation of life at birth is less than half the average figure for a European. Cholera was responsible for 59,000 deaths in Bengal alone. During the year 196,000 deaths from plague were recorded in British India; of these no fewer than 108,000 occurred in the Punjab and 57,000 in the United Provinces. In 1926 the infant mortality-rate per 1000 births for British India was 189, while in several towns approximately half the infants born died within the first year of life.

The medical inspection of school-children is in a very backward state, but such figures as are available indicate that the physical fitness of this class of the population is very unsatisfactory. In the administration report of the School Committee of the Bombay Municipality for 1926–27 some significant figures are given. There were 25,332 children inspected, of whom 18,786 were boys and 6546 girls. Of these 17,059 were examined for the first time and 8273 were re-examined as they had been found diseased in the previous year's inspection. Of those examined for the first time only 40 per cent. of the boys and 34 per cent. of the girls were found to be free from disease or defect. In other words, 60 per cent. of boys and 66 per cent. of girls were medically wanting. Malnutrition was the most prevalent condition (27·8 per cent. of boys and 32·2 per cent. of girls). Defective teeth were found in 26 per cent. and 27·5 per cent. respectively, and other common defects were those of the throat, nose, and eye, enlarged spleen (9 per cent.), enlargement of lymph glands, contagious skin diseases, and lung diseases.

Medical Research in India.

The annual Conference of Research Workers, held recently at the School of Tropical Medicine and Hygiene, Calcutta, under the presidency of Major-General T. H. Symons, Director-General of the Indian Medical Service, was attended by delegates from various parts of India representing different aspects of medical research, public health, and allied interests, to the number of about 50. Two schemes at present under consideration by the Government of India were discussed. One of these concerns the proposed establishment of an All-India Institute for Education and Research in Public Health, towards which the Rockefeller Foundation in America is offering assistance. This institute will be built close to the present Calcutta Tropical School, with which it would be associated. The second scheme is the result of the report of the Fletcher Committee, which suggested the establishment of a Central Institute of Medical Research at Dehra Dun. The influence of these two schemes on the activities of the Indian Research Fund Association was closely scrutinised. The researches carried on by the association during the past year were reviewed, and it was found necessary to stop a few of the inquiries and to limit activity of others on account of shortage of available funds. This still leaves a comprehensive programme of research into most of the principal diseases of India. The secretarial duties of the Conference were in the hands of Lieut.-Colonel F. P. Mackie, I.M.S., officiating Public Health Commissioner with the Government of India.

Tuberculosis in Bengal.

The grave menace to public health caused by tuberculosis in Bengal is brought out in a recent lecture by the Director of Public Health in that province. There is evidence that tuberculosis is exceedingly widespread in Bengal, not only in the towns but also in the rural areas. Investigations suggest that something approaching 10 per cent. of the total mortality in several districts is due to phthisis, and there are grounds for believing also that this is by no means an excessive estimate. In the case of Calcutta about 8 per cent. of all deaths are ascribed to tuberculosis, but Sir Leonard Rogers, as a result of a careful examination of the records of post-mortem examinations made in connexion with the Calcutta hospitals during the past 22 years, has shown that no less than 17 per cent. of the total deaths were due to tuberculous disease, and that in 25 per cent. of cases examined signs of tuberculosis were present.

Public Health Services.

INFLUENZA.

THE weekly returns of deaths attributed to influenza in England and Wales, of which a summary follows, do not show any increase abnormal for the time of year. In Scotland the deaths from influenza in the week ended Jan. 19th numbered 179, being 123 more than in the previous week. Of these 179 deaths, 151 occurred in Glasgow, about which our Scottish correspondent gives some details. In Northern Ireland an unusual number of deaths from influenza are reported in Belfast, where the prevalence of the disease has been manifest among the constabulary and in the transport service. Our Dublin correspondent writes that there is as yet apparently only one serious outbreak of influenza in the Irish Free State—namely, in Waterford. The Department of Local Government and Public Health has, however, acted wisely in issuing a circular to all sanitary authorities detailing the precautions to be taken against the spread of the infection. An educational leaflet has also been issued which relates the modes by which infection is spread, and advises the avoidance of all overcrowded houses of amusement and overcrowded public conveyances. Advice is given to those attacked to retire to bed at once and seek the aid of a doctor, and also to avoid any undue exertion for a considerable time after the attack. In the circular to sanitary authorities it is suggested that children from infected houses should not attend school, and in cases of epidemics in rural areas the schools might be closed. Patients suffering from influenza should be isolated early, and if a patient is nursed at home he should have a separate room. The danger of spitting is emphasised. Those suffering from influenza or catarrh should realise that they may convey infection to others with fatal results. The notification of pneumonia and influenza-pneumonia has been rendered obligatory by an order of the Department.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 12TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 213 (last week 188); scarlet fever, 2221; diphtheria, 1245; enteric fever, 28; pneumonia, 1936; puerperal fever, 37; puerperal pyrexia, 120; cerebro-spinal fever, 9; acute poliomyelitis, 4; acute polio-encephalits, 1; encephalitis lethargica, 19; dysentery, 5; ophthalmia neonatorum, 81. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified from the following 17 counties: London, 6; Bedford, 1; Chester, 2 (Ellesmere Port); Derby, 31; Durham, 45; Essex, 8 (West Ham); Lancaster, 13; Leicester, 13 (County Borough); Northampton, 10 (County Borough, 9); Northumberland, 16 (Tynemouth); Nottingham, 1 (Worksop R.D.); Soke of Peterborough, 8; Stafford, 1 (Stoke-on-Trent); Wilts, 1 (Swindon); Yorks, West Riding, 33; Glamorgan, 15 (of these Merthyr Tydfil 10), Monmouth, 9.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Jan. 15th-16th was as follows: Small-pox, 32 under treatment, 1 under observation; scarlet fever, 1984; diphtheria, 2153; enteric fever, 19; measles, 45; whooping-cough, 608; puerperal fever, 26 (plus 10 babies); encephalitis lethargica, 75; poliomyelitis, 4; "other diseases," 32. At St. Margaret's Hospital there were 19 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns including London there was 1 death from small-pox, 2 (0) from enteric fever, 28 (0) from measles, 8 (2) from scarlet fever, 59 (13) from whooping-cough, 50 (10) from diphtheria, 58 (15) from diarrhœa and enteritis under two years, and 122 (24) from influenza. The figures in parentheses are those for London itself.

The number of deaths from influenza during the previous seven weeks were 49, 56, 60, 61, 69, 83, and 99 respectively—a slow and even rise. The deaths in the week under review occurred largely in the midland and northern counties: Brimingham 6, Liverpool 5, Leeds 4. Glasgow reported 50 and Belfast 7, during the same week. The two deaths from enteric fever outside London occurred at Leyton and Newcastle-on-Tyne. Liverpool reported 7 deaths from measles, Hull and Sunderland 3 each. Leeds reported 4 deaths from whooping-cough, Salford, Oldham and Burnley 3 each (Glasgow 7). Five deaths from diphtheria occurred in Plymouth, 4 in East Ham, and 3 in Nottingham. Manchester reported 6 deaths from diarrhœa, Liverpool 5, and Salford 4. One death, provisionally classified to small-pox, was assigned to Halifax C.B.

The number of stillbirths registered during the week was 249 (corresponding to a rate of 36 per 1000 births), including 45 in London.

SOCIETY OF BRITISH NEUROLOGICAL SURGEONS.

THE fifth meeting of this Society was held in London in December under the presidency of Sir Percy Sargent. A visit was paid to Guy's Hospital, where Mr. Lancelot Bromley operated, turning an osteoplastic flap by de Martel's method. The Society was addressed by Dr. A. F. Hurst on the Cause of Trophic Disturbances in Nerve Injuries, and Dr. C. P. Symonds showed cases including radiograms of a calcified angioma of the brain, to which Mr. Bathe Rawling was able to exhibit a parallel. Dr. Symonds further exhibited a case illustrating tonic innervation of the hand in a young woman clinically diagnosed as a congenital aneurysm, and a case of cervical rib with cerebral embolism. The relationship between vessel compression and embolism was discussed. Mr. Bromley presented a female patient from whom he had enucleated a spinal tumour. Persistent contractures of the hamstrings had necessitated tenotomies, so successfully carried out by Mr. W. H. Trethowan that the patient was now able to walk up and down stairs. The meeting was resumed in the afternoon at the National Hospital, Queen-square, where Sir Percy Sargent opened a discussion on the Radium Treatment of Cerebral Tumours, and Mr. J. P. Ross described the technique and results so far obtained in a small group operated upon at St. Bartholomew's Hospital. This subject, theoretically so full of promise for the glioma patient, was fully discussed by other members. Dr. J. G. Greenfield's paper on the Hæmangiomatous Cysts of the Cerebellum (Lindau's tumour) preceded this, illustrated by a series of cases in which the pathology of the condition was built up step by step. Other papers read were: Prof. Archibald Young's on Chordoma, Mr. Julian Taylor's advocating a more posterior approach than the classical London route to the root of the Gasserian ganglion, Mr. A. A. McConnell's on Mistakes in the Interpretation of Ventriculograms, and Mr. Lambert Rogers's on Elephantiasis Neurofibromatosa. The Society's dinner was held at the Langham Hotel with Mr. Donald Armour in the chair. On the following morning Mr. L. R. Broster divided the sensory root of the trigeminal nerve for neuralgia and showed a number of patients, including a young woman with a suprarenal tumour and virility (the second example of this unusual condition which he has placed before the Society). Dr. W. J. Adie read a brief paper describing cases of spinal and pituitary tumours and emphasised the importance of being on the watch for these latter in cases of non-syphilitic optic atrophy. Dr. A. B. Rosher contributed a talk on the chemistry and cytology of cerebro-spinal fluid, whilst Dr. G. Viner discussed the histology of the gliomas and showed a number of specimens.

Correspondence.

"Audi alteram partem."

ASTHMA RESEARCH.

To the Editor of THE LANCET.

SIR,—Perhaps Mr. Frank Coke will forgive me if I take his letter in your issue of Jan. 19th as a text from which to plead for the serious consideration of the psychological aspect of asthma. He writes: "In the past those unfortunate people, the asthmatics, have been treated as neurotics, and their symptoms stigmatised as nervous manifestations, and they were told they were incurable." It is news to me that such a state of affairs once existed, but the phrases "treated as neurotics" and "stigmatised as nervous manifestations," suggest that he refers to an era before the development of modern psychopathology. He justifiably holds out hope of cure from the study of biochemical processes and his list of methods of cure—so divergent that it is difficult to conceive a theory of pathology common to all—is far from complete. From my own knowledge I can add cauterising the nasal septum, avoiding feather pillows, Christian Science, psychotherapy, and a visit to the battlefields of France—vagaries sufficient to suggest some factor not to be elucidated by research limited to biochemical phenomena.

Psychopathologists have of necessity received sufficient training to follow the work of Mr. Coke and his colleagues with reasonably intelligent interest. They have, in addition, the advantage of practical experience of the influence of mental processes, often unsuspected by the ordinary clinician, in producing emotional states which, in turn, find expression by alterations of physiological function. Some of them have recorded cases of asthma in which the sequence of pathological events was of this nature and, in spite of Mr. Coke's pessimism, they even hold out hopes of cure by psychological means. I myself am acquainted with people who actually claim to have been cured of asthma by some kind of psychoanalysis. Yet psychopathologists find no difficulty in reconciling their views with biochemical theory; some theory of the kind is necessary, for by their own hypothesis a physiological process is set in motion, and it must follow a biochemical path. They will even admit that to direct our therapy towards the physiological process is often justified by results.

We must accept as facts of observation both the biochemical phenomena and the disappearance of asthma after psychological treatment, treatment which is not haphazard but which often throws light upon the *why* of the situations that have called up the attack, and it is probable that the correlation of these two groups of facts may furnish the key to the whole problem. Instead of a collection of abnormalities to be interpreted only as freakish manifestations of a biochemical Puck, we have now a reasonable assumption of cause and effect that may be made a basis of research. As a point of attack we might start on the relation between hysterical dermatographia—a physiological sign of pathological anxiety—and the urticaria group or the dermal reactions of the asthmatic, not omitting a psychological study of the sufferers.

Those who regard an asthma patient as something more than a collection of test-tube reactions and conditioned reflexes will, in the interests of coöperation and understanding, protest against the point of view implicit in Mr. Coke's words as quoted above. I may be doing him an injustice, but I read into them that he uses "neurotic" as a term of reproach and regards any psychological approach to a disorder as an attack upon the moral integrity of the sufferer. This mental attitude still survives, and we often read in case reports such phrases as "the patient was in no way neurotic," the only information given by the phraseology being that the reporter does not appreciate possibilities. Would he recognise (or stigmatise) as "neurotic" the hardworking and overscrupulous type described in the leading article in the same issue? This protest concerns the nervous patient generally. With regard to the main question, it is not too much to say that any worker upon asthma who pushes aside the help offered by psychopathology deprives himself of an essential weapon.

I am, Sir, yours faithfully,

MILLAIS CULPIN.

Queen Anne-street, W. Jan. 21st, 1929.

THE TREATMENT OF HÆMORRHOIDS BY INJECTION.

To the Editor of THE LANCET.

SIR,—I note with surprise the renewed advocacy of the submucous injection treatment of hæmorrhoids. I recall a joint meeting[1] of the American Proctological Society and the corresponding subsection of the Royal Society of Medicine, held in London on July 9th, 1924, when, following a very able paper by the late Mr. Græme Anderson, and after a full discussion, the general opinion was that the method was only of use in simple uncomplicated cases, and that recurrence followed in some 50 per cent. of these. How is it possible for such a method to deal with those cases, very common, in which there is a large protruding œdematous mass of rectal tissue, showing bleeding ulcerative piles higher up? I feel certain that if Mr. Christopher Howard and Mr. A. S. Morley will try the treatment by galvanopuncture into the vein itself, described by me before the Harveian Society in October, 1925, and afterwards published,[2] they will never use any other method. I am, Sir, yours faithfully,

Harley-street, W., Jan. 21st, 1929. W. S. WHITCOMBE.

MYOFIBROSITIS.

To the Editor of THE LANCET.

SIR,—In his address on Myofibrositis as a Simulator of Other Maladies, published in your issue of Jan. 19th, Prof. G. R. Murray is highly interesting and informative, but he does not give any evidence of the symptoms mentioned being caused by fibrositis. However tempted one may be to agree with him—and it would be impossible to prove that they were not so caused—Prof. Murray's readers would be grateful for definite evidence of fibrositis being the fiend that causes all this trouble. Positive evidence is much more satisfactory than reasoning by exclusion.

I am, Sir, yours faithfully,

SHEFFIELD NEAVE.

Ingatestone, Essex., Jan. 21st, 1929.

TEACHING OF MEDICAL HYDROLOGY.

To the Editor of THE LANCET.

SIR,—Owing to the proposal to make spa treatment available for insured patients suffering from rheumatism and kindred ailments, it is probable that many medical men in this country would be glad of the opportunity of learning something of a method of treatment which is more familiar to the medical profession on the Continent than in Great Britain. Until quite recently the only means of obtaining information on these subjects was to visit one of the spa hospitals, but in 1923 a Committee was formed, composed of representatives of the chief spas of Great Britain, and from London, for the purpose of giving instruction in medical hydrology in the universities and medical schools of Great Britain. This function the Committee still performs, but it is thought that some medical societies not connected with teaching centres might care to hear lectures

[1] See THE LANCET, 1924, ii., 117.
[2] Brit. Med. Jour., 1925, ii., 992.

on this subject. The Committee has selected as lecturers a number of medical men who have expert knowledge of the subject, and I shall be glad to forward a list of their names to the secretary of any medical society who may wish for further particulars.

I am, Sir, yours faithfully,

GEOFFREY HOLMES, M.B. Camb.,
Honorary Secretary,
The Committee for the Study of Medical Hydrology in Great Britain.

11, Ripon-road, Harrogate, Jan. 15th, 1929.

THE CAUSE OF SEA-SICKNESS.

To the Editor of THE LANCET.

SIR,—A good deal of controversy has raged in the medical press and elsewhere on the pros and cons of ocular sensation as a cause of sea-sickness. The following personal experience may have some bearing on the matter.

As a sailor I have experienced the sensations of sea-sickness sufficiently often to recognise them without any doubt or question, though fortunately, provided there is an adequate supply of food available to fill the gaps as created, I have not suffered severe incapacity. I have noticed similar sensations when trying to read in a corner seat with my back to the engine in a train, but I have never known any similar sensation in any shape or form while in a motor-car until Sunday last. On this occasion, I drove from Hammersmith Broadway to Roehampton through a dense white fog, which was drifting steadily almost at right angles across the road in front of us; and, after some half hour or so of groping along, the all-too-familiar sensations returned with sufficient severity to render it almost impossible to keep my seat, although I did manage to survive with a considerable effort.

In a still fog, such as one usually encounters in London, I have never known a similar sensation to the smallest extent, and can only conclude that in my own case at any rate ocular sensations must play a very large part in the production of the symptoms.

I am, Sir, yours faithfully,

Jan. 22nd, 1929. M.A., M.D.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

REASSEMBLY OF PARLIAMENT.

BOTH Houses of Parliament reassembled after the Christmas recess on Tuesday, Jan. 22nd.

HOUSE OF COMMONS.

TUESDAY, JAN. 22ND.

Report on Milk Prices.

Mr. ROBERT MORRISON asked the President of the Board of Trade whether the Food Council had now completed its report upon milk prices; and when it would be published.—Sir P. CUNLIFFE-LISTER replied: I understand that the preparation of the report has reached an advanced stage, but I cannot give a definite date for its publication.

Slum Clearances in Glasgow.

Mr. STEPHEN asked the Secretary of State for Scotland the total number of houses built in Glasgow last year under the slum clearance scheme and the corresponding figure for the previous year; and how many slum houses it was estimated remain to be dealt with.—Sir J. GILMOUR replied: The total number of houses completed in Glasgow under slum clearance schemes was 996 in 1926 and 838 in 1927. I am informed that the estimated number of slum houses in the city remaining to be dealt with is 13,000.

Slum Clearance Schemes.

Lieut.-Commander KENWORTHY asked the Minister of Health how many houses had been demolished under slum clearance schemes in the last four years; and how many persons formerly living under slum conditions had been re-housed under these schemes.—Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) replied: Information in regard to the matter referred to by the hon. and gallant Member is only available from April 1st, 1925. Between that date and Dec. 31st, 1928, the latest date for which particulars have been furnished, 8540 buildings have been acquired for demolition, 6002 buildings have been demolished, and 6949 new dwellings have been erected in connexion with slum clearance schemes. It is estimated that approximately 31,000 persons have been re-housed in these new dwellings.

Lieut.-Commander KENWORTHY asked if there was any prospect of these meagre operations being expedited.

Sir KINGSLEY WOOD replied that considerable progress had been made during the last few years, as local authorities were displaying more vigour in dealing with slum clearance schemes.

Obituary.

FERNAND WIDAL, M.D. PARIS,

PROFESSEUR AGRÉGÉ DE LA FACULTÉ DE MÉDECINE.

WE regret to announce the death from cerebral hæmorrhage on Jan. 14th at his *appartement* in Paris of Prof. Widal, whose name is everywhere familiar in connexion with the agglutination reaction.

Georges Fernand Isidore Widal was born on March 9th, 1862, at Dellys in Algiers, a small town, few of whose inhabitants are European, situated a mile or two east of Algiers on the coast. He received his medical education in Paris, and by his attainments and his application made a mark among his fellows in early life. He was an interne des hôpitaux in 1885, took his doctorate in 1889, and he was but 27 years of age when he published his treatise on Puerperal Infection, a work which showed that he possessed already a valuable power of bringing laboratory experience directly to the bedside. He became professeur agrégé in 1895, and in the following year he obtained world-wide fame by the so-called Widal test for the diagnosis of typhoid fever. The association of his name alone, however, with this test was an error. The discovery of the agglutinating action of typhoid serum and its application to the clinical diagnosis of typhoid fever occurred in 1896, and was the work of H. E. Durham, Max Gruber of Vienna, and Widal. A good deal of acrimonious discussion has taken place with regard to the respective merits of these workers, but there is little doubt now that the pioneer was Gruber. The first actual publication, with admitted acknowledgments to Gruber, was made by H. E. Durham. This was in January, 1896, and it was followed by two communications from Gruber and Durham in March of the same year. In Durham's first paper on the subject attention was directed to the possibilities of the agglutination method for the clinical diagnosis of typhoid fever, and this phenomenon was demonstrated by Widal on June 26th, 1896. Early in September A. S. Grünbaum (afterwards Leyton) published in THE LANCET (1896, ii., 806) a Preliminary Note on the Use of the Agglutinative Reaction of Human Serum for the Diagnosis of Enteric Fever, in the course of which he referred to Widal's work in terms which the French pathologist resented. Widal's own description of the significance of his researches followed in THE LANCET in November of the same year when he claimed his position as the author of the new method—viz., that of "serum diagnosis by which typhoid fever can be recognised almost

FERNAND WIDAL.

instantaneously by simply observing microscopically how the serum of a patient acted on a culture of Eberth's bacillus." The question of priority was thus challenged, but it is now seen to be of little significance and its phenomena are usually now termed simply the agglutination reaction.

Following on the developments in the diagnosis and prevention of typhoid fever, especially in sequence to discoveries in respect of typhoid vaccination, Widal achieved a reputation for original research which perhaps he hardly merited. He became one of the best-known medical men in Paris, being especially a prophet of the idea that science should be applied in practice, a doctrine which drew to him a very large following of young men, and which can hardly be called novel. But his clinical fame was truly earned, and will largely rest on his hospital work at the Cochin Hospital, where his classes were admirably organised and where his brief lectures invariably attracted large crowds. His laboratory work in the later phases of his career was of a desultory character; he showed extreme keenness in many directions, but can hardly be credited with any ordered researches. None the less he certainly enjoyed and deserved his great position as a physician, and his qualities as a man of the world stood him in excellent stead with the public.

Prof. Widal had been confined to bed for a week with an acute attack of gout when cerebral hæmorrhage proved rapidly fatal. He was buried at the cemetery of Montmartre on Jan. 17th, when the funeral address was delivered by Prof. Lemmière.

THOMAS BROOK, B.D., M.D., LL.D. Dub., who died at Biskra in Algeria on Jan. 7th, was a graduate of Trinity College, Dublin, in arts, divinity, medicine, and law. He was ordained in 1895 and after holding a curacy in Derbyshire and another in London returned to Dublin as acting chaplain to the Forces. This gave him the chance of studying law, and when next he returned to Dublin, after a period as Army chaplain at Malta, he graduated in medicine also. During the late war he served in France and Salonika, and on retirement from the Service in 1919 he was attached to the staff of the Ministry of Pensions for some time, later acting as medical officer to the Brigade of Guards at Pirbright. He had gone to Biskra for the benefit of his health, and died at the age of 58.

BY the death of ARTHUR HENRY HEADLEY HUCKLE, M.R.C.S., L.D.S., on Jan. 13th, Hastings loses a practitioner of high standing in the neighbourhood. An Australian by birth, he was born at Melbourne in 1871, and was a son of the late Frederick Thomas Huckle. He came to England as a child and was educated at Dulwich College and University College, London. He studied medicine at Guy's Hospital, and after taking both dental and medical diplomas was also called to the Bar. In 1904 he was appointed medical superintendent of the Hastings Borough Sanatoria, and in 1901 he joined the staff of the Royal East Sussex Hospital as honorary pathologist and dermatologist. Of late years he was medical officer of the Hastings and East Sussex venereal diseases clinic. Dr. Huckle married Grace, only daughter of the late Dr. Walter Farnfield, and his widow is left with one daughter.

HERBERT NORMAN EVANS, B.M. Oxf., who died at Seaford on Jan. 9th in his ninety-fourth year, was the eldest son of Dr. Herbert Norman Evans, of Hampstead, and was educated at Winchester and Exeter College, Oxford. Like his father and his grandfather before him, he adopted medicine as a profession, and after studying at St. Bartholomew's Hospital became M.R.C.S. Eng. in 1860. From 1864 until 1893 he practised in Hampstead, being appointed surgeon to the Hampstead Dispensary. On retirement he went to live at Seaford, and enjoyed remarkably good health until quite recently. Dr. Evans had been a good rifle shot, and joined the Volunteers in August, 1859, when the movement was started. He served for 33 years as a private in the 3rd Middlesex Regiment, his professional work preventing him from giving up more time. He was twice married and leaves four children.

THE death has occurred at Oswestry of ROBERT DE LA POER BERESFORD, M.D. Glasg., at the age of 86. Educated at Trinity College, Dublin, he also studied medicine at the University of Glasgow, where he graduated M.D. in 1871, having previously qualified L.R.C.P. & S. Edin. in 1869. In 1916 he took the D.P.H. of Liverpool University. Dr. Beresford went to Oswestry more than 60 years ago and for 59 years was medical officer for the town. He was a justice of the peace for Shropshire and mayor of Oswestry for two years.

JOHN HARRISON, M.R.C.S., who died at Braintree on Jan. 16th, qualified in 1882 after studying at Guy's Hospital, and was appointed coroner for North Essex over 44 years ago. During his term of office he held over 5000 inquests. Dr. Harrison was 72 years of age and was educated at Felsted School, where he was afterwards medical officer.

THE death took place on Jan. 14th, in his eighty-first year, at his home in Sheffield, of ALGERNON ARCHIBALD PAYNE, M.R.C.S., who was the oldest medical practitioner in the city. He qualified in 1877 after studying at Sheffield and St. Bartholomew's Hospital, and was in practice in Sheffield for over half a century. He was an authority on war medals and decorations and on British and foreign Orders, and in 1911 he published a book on this subject. He also wrote a history of the York and Lancaster Regiment.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At a congregation on Jan. 18th the following degrees were conferred:—

M.B. and B.Chir.—S. W. Savage and Fred Smith.

B.Chir.—Leslie Foulds, Edward Clayton-Jones, A. J. Dix Perkin, H. F. Bateman, L. T. Hilliard, and J. C. F. Lloyd-Williamson.

ROYAL INSTITUTION.—On Tuesday, Jan. 29th, at 5.15 P.M., Prof. J. S. Huxley begins a course of six lectures on Evolution and the Problem of Species, and on Thursday, Jan. 31st, Sir William Bragg gives the first of three lectures on the Early History of X Rays.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL.—A post-graduate course in orthopædic surgery will be held at this hospital from March 11th to 23rd, with lectures and demonstrations daily. Further particulars may be had from the Secretary of the hospital, 234, Great Portland-street, London, W. 1, or from the Fellowship of Medicine.

ROYAL LONDON OPHTHALMIC HOSPITAL.—The annual dinner of past and present students of this hospital will be held at the Langham Hotel, Portland-place, London, W., on Thursday, Feb. 7th, at 7 for 7.30 o'clock. Mr. Charles Howard Usher will preside, and applications for tickets should be addressed to Sir William Lister, 24, Devonshire-place, W. 1.

HOSPITAL ASSESSMENTS.—Considerable increases have been made in the valuation of hospitals in the area of the North Middlesex Assessment Committee: the Prince of Wales's Hospital, Tottenham, has been raised from £335 to £1650; Hornsey Central from £20 to £440; Wood Green from £15 to £300; Enfield from £12 to £372.

ST. BARTHOLOMEW'S NURSES.—Last week the Lord Mayor of London declared open the new recreation rooms of Queen Mary's Home for the St. Bartholomew's Nurses. There are separate sitting-rooms for nurses and probationers, a lecture-room, a class-room, and the Isla Stewart Memorial Library. Two blocks of the home are already in use, and it is hoped that the southern extension will be ready for occupation late in the present year.

LIVERPOOL JEWISH HOSPITAL.—A house in Alexandra-road, Aigburth, has been purchased for conversion into a Jewish hospital. The building has passed the scrutiny of a committee of 20 medical men.

A "SILVER PAPER" COT.—Viscountess Craigavon, wife of the Prime Minister of Northern Ireland, last week gave this name to a cot in the Ulster Hospital for Children and Women, Belfast. It has been endowed with money derived from the sale of "silver paper."

A SCOTTISH FEVER AND TUBERCULOSIS HOSPITAL.—Major Walter Elliot, M.P., recently opened a new fever and tuberculous hospital at Wester Moffat, Airdrie. The work has cost £36,000.

NAVAL MEDICAL COMPASSIONATE FUND.—At a quarterly meeting of the directors of the Fund, held on Jan. 22nd, Surgeon Vice-Admiral Arthur Gaskell, Medical Director-General of the Navy in the chair, the sum of £100 was distributed among the several applicants.

GLASGOW STUDENTS' COLLECTIONS FOR CHARITIES.—The students of Glasgow University on Jan. 19th collected over £15,000 for local charities, and several contributions have still to be added. It is expected that this year's collection will be little short of that of last year's, which amounted to £16,500. In nine years the Glasgow students have raised nearly £100,000 for local charities.

LONDON, MIDLAND, AND SCOTTISH RAILWAY HOSPITAL FUND.—The total receipts of this fund last year were £145,000, of which £40,000 was contributed by the Company and £105,000 by the men. Hospitals received £90,000 and convalescent homes £20,000; dental treatment and surgical and optical appliances absorbed £25,000.

RADIUM IN SWEDEN.—Six grammes of radium sulphate, purchased at a cost of £63,000, is the first result of the national gift of the Swedish people to King Gustaf V. on the occasion of his seventieth birthday last year. According to the special wish of the King, this gift fund, which now amounts to more than £280,000, will be used entirely for fighting cancer.

ULSTER MEDICAL SOCIETY.—At a meeting of this Society on Jan. 10th the President, Prof. T. H. Milroy, moved, and Dr. J. S. Morrow seconded, a resolution recording appreciation of the valuable services rendered to the Society by the late Dr. W. L. Storey, who for 35 years took an active interest in all its affairs.—Dr. S. B. Boyd Campbell read a paper on the Treatment of the Sequelæ of Encephalitis Lethargica by Malaria, demonstrating a number of cases to the meeting, and reviewing a series of 50 cases in which this method had been tried. Dr. J. S. Morrow, Dr. A. Gardner Robb, Sir Thomas Houston, Dr. F. Coates, Dr. J. C. Young, Dr. N. B. Graham, Dr. W. Burns, Mr. J. O'Doherty, and the President joined in the discussion which followed.

TORBAY HOSPITAL CONTRIBUTORY SCHEME.—A town's meeting at Torquay has adopted a contributory scheme for the recently opened Torbay Hospital. Contributors will be divided into three classes. Class 1 will have an income-limit of £200 a year for a single person over 16, or a widow or widower without children under that age, who will contribute a penny a week. Class 2 will have an income-limit of £250 for married couples without children under 16, and persons with one dependent under that age, who will contribute twopence per week. Class 3 will have a limit of income of £300 for married couples with a child or children under 16, and persons with more than one dependent under that age, who will contribute threepence weekly. Letters will be required only for non-contributors, who will be expected to pay towards their maintenance at the hospital and for the use of the ambulance.

THE FUTURE OF SURGERY.—In the course of an address delivered in opening the new operating theatres at the Leicester Royal Infirmary on Jan 23rd, Mr. C. J. Bond said that it was quite likely that the principles and practice of surgery would undergo change and development as knowledge grew. For instance, it might be that the all-penetrating beta and gamma rays, with their associated bombarding projectiles from a disintegrating radium atom on its way to become lead, would exercise a more discriminating and lethal effect on growing and multiplying cancer cells than the sharpest knife of the most skilful surgeon. It might be that, instead of incising and draining abscesses, the surgeon of the future would be busy in preventing their formation by the timely supply into the blood stream of antitoxins and other immunity-conferring materials. The surgeon of to-morrow must be a pathologist as well as a surgeon. He must be more and more concerned with the biochemical and physiological principles which underlie the healing of wounds, and normal and disorderly cell growth. In the industrial world to-day there was a danger that the man might be enslaved by the machine. In the same way a too rigid observance of ritual, and a too confined attention to the merely mechanical side of the art of surgery, must not be allowed to limit the surgeon's outlook. He was, or should be, concerned with living forces, not dead.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Jan. 28th.—8 P.M., ODONTOLOGY. Casual Communications: Mr. A. T. Pitts: Two Compound Composite Odontomata. Dr. J. Kingston Barton: The Prevention of Diseases of the Teeth in Children. Mr. W. Rushton: The Use of Cement Linings in Cavities. Paper: Mr. G. B. Pritchard: Some Notes on the Origin and Prevention of Gingivitis.

FRIDAY, Feb. 1st.—10.30 A.M., OTOLOGY. (Cases at 9.30 A.M.) Demonstration of some graphic records of instability illustrative of cases referred to by Mr. Sydney Scott, by Dr. A. Lowndes Yates. Papers: Mr. Sydney Scott: Vertigo. Mr. A. R. Tweedie: Some Notes on the Rotation Caloric and Galvanic Tests. Cases and specimens will be shown by Mr. E. A. Peters, Mr. M. Vlasto, Mr. Archer Ryland, Mr. W. N. M. Girling, and Mr. Eric Watson-Williams. 5 P.M., LARYNGOLOGY. (Cases at 4 P.M.) Cases and specimens will be shown by Mr. Eric Watson-Williams, Mr. F. J. Cleminson, Mr. Norman Patterson, and others. 8.30 P.M., ANÆSTHETICS. Paper: Dr. R. D. Lawrence: Post-operative Acidosis.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street-Cavendish-square, W.

MONDAY, Jan. 28th.—8.30 P.M., Discussion on Starvation in Treatment, introduced by Dr. E. I. Spriggs, followed by Sir Thomas Horder.

ROYAL INSTITUTION, 21, Albemarle-street, W.

THURSDAY, Jan. 31st.—5.15. P.M., Sir William Bragg: The Early History of X Rays.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn, W.C. (Hunterian Lectures.)

MONDAY, Jan. 28th.—5 P.M., Prof. Arthur Evans: Developmental and Enterogenous Cysts and Diverticula.

WEDNESDAY.—5 P.M., Prof. G. E. Gask: Treatment of Malignant Diseases by Radium (with demonstration of patients).

FRIDAY, Feb. 1st.—5 P.M., Prof. C. A. Pannett: Local Anæsthesia in the Surgery of the Upper Abdomen.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Jan. 28th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY, Feb. 1st.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

LONDON SCHOOL OF DERMATOLOGY, 49, Leicester-square, W.C.

TUESDAY, Jan. 29th.—5 P.M., Dr. W. J. O'Donovan: Exfoliative Dermatitis.

THURSDAY.—5 P.M., Dr. H. Haldin-Davis: Pruritus, Prurigo, Lichenification.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Jan. 28th, to SATURDAY, Feb. 2nd.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Mon., at 5 P.M., Lecture, Mr. Malcolm Hepburn: Some Apparent Difficulties of General Practitioners in Ophthalmic Work.—HOSPITAL FOR CONSUMPTION, Brompton, S.W. Tues., at 4.30 P.M., Clinical Demonstration by Dr. Batty Shaw.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Tues., at 4–6 P.M., Lecture: The Injection Treatment of Varicose Veins, followed by a demonstration of the methods and results in over 50 cases by Mr. Rodney Maingot.—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed., at 4 P.M., Demonstration by Dr. R. A. O'Brien on Vaccines and Sera: their Prophylactic and Therapeutic Value in General Practice. The above are free.—PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N. Intensive course in Medicine, Surgery, and the Specialties, for two weeks.—BETHLEM ROYAL HOSPITAL, S.E. Tues. and Sat., at 11 A.M., Lecture-demonstrations.—QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, E. Second week of special course. Further particulars from the Secretary.

NATIONAL HOSPITAL, Queen-square, Bloomsbury
MONDAY, Jan. 28th.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Mr. Williamson Noble: Optic Neuritis.
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Critchley: Transient Hemiplegias and Similar Cerebral Attacks.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Mr. Just: Methods of Testing the Eighth Nerve.
FRIDAY, Feb. 1st.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Mr. Elmquist: Demonstration of Re-educative Methods.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Jan. 31st.—4 P.M., Mr. Lloyd: Some Orthopædic Principles.

ST. MARY'S HOSPITALS POST-GRADUATE LECTURE, Manchester.
FRIDAY, Feb. 1st.—4.30 P.M. (at the Whitworth-street West Branch), Dr. Dougal: The Management of Occipito-posterior Positions.

NATIONAL COUNCIL FOR MENTAL HYGIENE.
WEDNESDAY, Jan. 30th.—5 P.M. (at the Medical Society of London, Chandos-street, W.), Dr. Hugh Crighton-Miller: Dangerous Ages: Youth.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
FRIDAY, Feb. 1st.—3.30 P.M., Mr. Graham Simpson: Surgical Cases.

Appointments.

ABEL, A. LAWRENCE, M.S. Lond., F.R.C.S. Eng., has been appointed Surgeon to the Cancer Hospital.
BACK, MARJORIE, M.D. Lond., D.P.H. Camb., Assistant Medical Officer of Health for the county of Surrey.
GARLAND, H. S., M.B. Lond., M.R.C.S., House Physician, National Hospital, Queen-square, W.C.
KEITH, F. L., M.D. Aberd., D.P.H., Medical Officer of Health for Deptford.
MILLER, ARTHUR A., D.L.O., M.R.C.S., Assistant Out-patient Registrar to the Central London Ear, Nose and Throat Hospital.
WEBSTER, J. M., M.B., Ch.B. St. And., F.R.C.S. Edin., Surgeon to the Sheffield City Constabulary.

Certifying Surgeons under the Factory and Workshop Acts: BICKNELL, A., M.D. Liverp. (Holylake, Chester); FULLERTON, J. A., M.B., Ch.B. Edin. (Mossley, Lancs.); HAMMERTON, G. H. L., L.R.C.P., L.R.C.S. Edin. (Dewsbury); STEWART, W. P. A., M.B., Ch.B. Glasg. (Kilbride-Bute); and WHITLEY, J. T., M.B., Ch.B. Manch. (Chelmsford, Essex).

Vacancies.

For further information refer to the advertisement columns.

Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.
Birkenhead General Hospital.—Hon. Physician.
Birmingham, Little Bromwich, City Hospital for Infectious Diseases.—Fourth Asst. M.O. £300. Also Two Visiting Surgeons. Each £200.
Birmingham Royal Cripples Hospital.—Sen. H.S. £400.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. At rate of £120.
Bolton, Townleys Hospital, Farnworth.—Asst. M.O. £400.
Bradford Royal Infirmary.—Two H.S.'s. Each £150.
Cardiff Royal Infirmary.—Ophth. H.S. Also Gynæcological H.S. At rate of £75 and £50 respectively.
Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Res. H.S. At rate of £75.
Chadwick Trustees.—Two Travelling Scholarships. £400 each.
Charing Cross Hospital, W.C.—Asst. Physician.
Coventry and Warwickshire Hospital.—Res. H.S. £125.
Dreadnought Hospital, Greenwich.—Physician to Out-patients.
Durham County Council, Education Department.—Asst. School M.O. £600.
Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Asst. Pathologist.
Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.
Glasgow, Gartloch Mental Hospital, Gartcosh.—Jun. Asst. M.O. £300.
Glasgow Royal Cancer Hospital.—Medical Officer. £600.
Gloucester County Mental Hospital.—Jun. Asst. M.O. £350.
Great Yarmouth, General Hospital.—H.S. £150.
Hospital for Sick Children, Gt. Ormond-street, W.C.—Cas. O. £400. Also Asthma Research Scholar. £300.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Asst. Surgeon.
Ilford Isolation Hospital.—Temporary R.M.O. £350.
Jersey Mental Hospital.—Med. Supt. £650.
Leyton Borough.—Asst. M.O. £600.
London Temperance Hospital, Hampstead-road, N.W.—Med. Reg. 40 guineas.
Maidstone, Kent County Ophthalmic and Aural Hospital.—Ophth. H.S. Also H.S. to Ear, Nose and Throat Dept. Each at rate of £200.
Malayan Medical Service.—Medical Officers. £700 per annum.
Melbourne University, Victoria, Australia.—Chair of Obstetrics. £2000.
Metropolitan Asylums Board.—Bio-chemist at the Board's Anti-toxin Establishment, Sutton, Surrey. £600.
Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Asst. Radiologist.
Oxford, Radcliffe Infirmary and County Hospital.—Hon. Surgeon.
Plymouth, South Devon and East Cornwall Hospital.—Cas. H.S. At rate of £100.
Preston Union.—Jun. Res. M.O. At rate of £104.
Princess Louise Kensington Hospital for Children, North Kensington.—Hon. Asst. Surg.
Queen's Hospital for Children, Hackney-road, E.—Asst. Surg.
St. Mary's Hospital for Women and Children, Plaistow, E.—Res. and Asst. Res. M.O.'s. At rate of £175 and £120 respectively.
Salisbury, General Infirmary.—Res. M.O. £150.
Southampton County Borough.—Asst. School Dentist. £150.
Stafford, County Mental Hospital.—Second Asst. M.O. £600.
Swansea County Borough Infectious Diseases Hospital.—Res. M.O. £350.
Warwickshire County Council.—Asst. County M.O.H. £600.
Wellington Hospital, New Zealand.—Orthopædic Specialist. £900.
West Bromwich, Hallam Hospital, Hallam-street.—Ophthalmic Surgeon. £75.
West London Hospital, Hammersmith-road, W.—Hon. Obstetric Registrar.
Willesden General Hospital, Harlesden-road, N.W.—Hon. Ophthalmic Surgeon.
Woolwich and District War Memorial Hospital, Shooters' Hill, S.E.—H.S. At rate of £125.
Worcester County and City Mental Hospital, Powick.—Jun. Asst. M.O. £350.
York, The Retreat.—Jun. M.O. £300.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at New Tredegar (Monmouthshire), Grampound (Cornwall), Drummore (Wigtownshire), Pulborough (Sussex), West Linton (Peeblesshire), Kippen (Stirlingshire), and Waltham Abbey (Essex).

The Home Secretary gives notice of vacancies under the Workmen's Compensation Act, for the Districts of the Abergavenny and Blaenavon, Crickhowell, Monmouth, and Tredegar, Abertillery and Bargoed County Courts, and for the Districts of Llangefni, Holyhead and Menai Bridge County Courts (Circuit No. 29). Applications should reach the Private Secretary, Home Office, not later than Feb. 7th.

Births, Marriages, and Deaths.

BIRTHS.

ALEXANDER.—On Jan. 16th, at Queen-square, Lancaster, the wife of Dr. Alexander, of a son.
ANDERSON.—On Jan. 19th, at Ribblesdale House, Hornsey, the wife of Roy S. Anderson, M.R.C.S., L.R.C.P., of a son.

MARRIAGES.

BRAHAM—HINCKS.—On Jan. 21st, Noel Braham, O.B.E., M.C., F.R.C.S., to Mrs. Ruth Hincks, daughter of the late Ludwig Wiborg, of Brevik, Norway.

DEATHS.

BAKER.—On Jan. 16th, suddenly, at Elmstead, Andover, Hants, Henry Francis Baker, F.R.C.S., aged 83.
BIANCHI.—On Jan. 17th, at Brighton-place, Portobello, Edinburgh, Leo Ferdinando Bianchi, F.R.C.S., F.R.C.P. Edin.
BIRKETT.—On Jan. 19th, at "Merrilyn," Lee-on-the-Solent, Dr. H. J. D. Birkett.
BROOK.—On Jan. 7th, at Biskra, Algeria, Rev. Thomas Brook, B.D., LL.D., M.D., D.P.M., Chaplain to the Forces (retired), aged 58 years.
COLBORNE.—On Jan. 15th, at Hayling Island, the Rev. George Colborne, M.A., Ph.D., M.R.C.S., L.R.C.P., aged 83 years.
HUCKLE.—On Jan. 13th, at Tillington Lodge, Hastings, Arthur Henry Headley Huckle, J.P., of the Middle Temple, Barrister-at-Law, M.R.C.S., L.R.C.P., D.P.H.
SOWDEN.—On Jan. 19th, at St. Giles, Elgin, George Smith Sowden, M.A., M.D., aged 46 years.
SQUIRE.—On Jan. 13th, at Granville Lodge, Westgate-on-Sea, Maurice Frederick Squire, M.D., M.R.C.S., L.R.C.P.
VICKERY.—On Jan. 12th, at Brighton, after a short illness, Alice Vickery, L.R.C.P. Irel., in her 85th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET," VOL. II., 1928.

THE Index and Title-page to Vol. II., 1928, which was completed with the issue of Dec. 29th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

Notes, Comments, and Abstracts.

THE TRAINING OF THE COMPLEAT CHYRURGION:

THE BACKWARD LOOK AND THE LOOK AROUND.*

BY ARCHIBALD YOUNG, B.Sc., M.B., C.M., F.R.F.P.S. GLASG.,

REGIUS PROFESSOR OF SURGERY, UNIVERSITY OF GLASGOW.

THE training of "the compleat chyrurgion" must be a thorough and comprehensive process, and cannot be accomplished even approximately within the limited number of years that he is an undergraduate. Only if his early training is well founded and securely based may one look with confidence for the larger development and the greater competency that the surgeon must have if he is to be in any real sense "compleat." His training must go on without cessation all through his active life, and he must keep himself *au fait* with every development of his science and of his art. Reading, observation, experiment, discussion with others, young as well as old—and perhaps he will get in many ways a greater inspiration from the former than from the latter—these and other sources of knowledge and of improved technique must be utilised to the full. Two directions of study, two aspects of the surgeon's training, will amply repay cultivation: medical history and travel.

THE BACKWARD LOOK.

We are apt to get into the habit of assuming that most of the achievements of the surgery of to-day are peculiar to this century, half century, or even this last decade; that there was indeed no such thing as surgery, as we now understand it, until almost within the memory of our grandfathers. It is a very salutary corrective to this impression or assumption to glance back for a little upon the history of surgery in the past. It is not its earlier primitiveness, its extremely limited scope and achievement in earlier times, that surprise us, but rather the extraordinary state of development, especially on the technical side, to which it had attained even many centuries ago. As far back as 360 B.C., Hippocrates made use of counter-irritation, used the actual cautery, set fractures, and trepanned the skull. Celsus (A.D. 17) performed lithotomy. He did amputations. He described an operation for cataract. He was probably the first to recommend the ligature of arteries for the arrest of hæmorrhage. He even attempted the radical cure of hernia. Like Hippocrates, he trepanned or trephined the skull. Galen (A.D. 150) developed the art of bandaging, described and used complicated machinery for the treatment of fractures and dislocations, and like Celsus, employed ligatures for the control of hæmorrhage. Paulus Æginata (A.D. 700) performed many operations, such as lithotomy, laryngotomy, tracheotomy, and amputation of the breast. One might multiply evidence of this kind almost indefinitely. Let us trace the history of the development of surgery in one particular department.

The Operation of Trepanning.

Trepanning certainly goes back as far as the time of Hippocrates—that is, over 300 years before the Christian era—but Lucas-Championnière, in his "Les Origines de la Trépanation décompressive," depicts a skull from the Neolithic period, which shows a large smoothly rounded orifice in the left parieto-occipital region, almost certainly the relic of a therapeutic trephining. Had it been done at the present day it could hardly have been bettered; and it must have been done with flint. Victor Horsley, after making a careful investigation of the skulls in the Broca Museum in Paris, in 1887, concluded: "(1) That the operative openings were nearly always over the site of representation of movement on the cerebral cortex; (2) that the patients had probably been suffering from Jacksonian epilepsy; (3) that the operation would gain a certain reputation for the cure of convulsions generally; and (4) that at least some of the operations—e.g., for depressed fracture—would result in cure" (Ballance).

It is clear that Hippocrates trepanned the skull for the purpose of decompression, to relieve inflammation, for the evacuation of pus and blood, and for the extraction of foreign bodies. His writings show also—and this is perhaps the most remarkable fact of all—that he recognised the contralateral distribution of convulsions and paralyses following upon certain head injuries. It is on record, too, that he recommended the use of the trephine for the treatment of blindness not due apparently to any obvious disease of the eye. This is surely the very earliest known recognition of the value of decompressive trephining for the relief of optic neuritis. Celsus advocated trephining for the evacuation of blood poured out between the dura and bone, and forming a clot, even where the bone was not obviously broken. From these early times and on through the centuries operations on the skull continued to be practised, and we find in the writings of Roger of Salerno (A.D. 1170), Walter of Agilon (middle of thirteenth century), Ambrose Paré (1560), Andreas a Cruce (1573), Fabricius Hildanus (1560–1634), references to trephining or trepanning for fracture of the skull, for the relief of pressure by blood or pus, and for the treatment of "dolor capitis." Descriptions are given as to how a sufficiently large opening may be made by joining up adjacent trephine holes, to allow of the removal of the intervening bone. There are in some of the works—e.g., those of Andreas a Cruce and Peter Paaw—numerous illustrations of such operations and of the instruments employed. It is of interest to compare the latter with some of our present-day instruments; the resemblances are more remarkable than are the differences. Some of the instruments credited to Hippocrates—both trepans and trephines—are furnished with devices to prevent them penetrating too deeply. These devices are in some cases bars or rings; some of the instruments are bevelled from below upward; some of the trephines have metal collars not unlike the collar guards of the trephines of to-day.

There are other simpler instruments figured in the same works which bear a very close resemblance to many in common use at the present time. The words of the Preacher must surely come back to our minds, as we survey the armamentarium of Hippocrates, and compare it with our own: "The thing that hath been, it is that which shall be; and that which is done is that which shall be done; and there is no new thing under the sun. Is there anything whereof it may be said—See, this is new? It hath been already of old time, which was before us."

Percival Pott (1713–1788), Petit (1674–1750), John Hunter (1728–1793), Larrey (1766–1842) and others, with varying courage and with a gradually advancing degree of clinical exactitude, carried out operations on the skull for injuries occurring both in civil and in military practice, and began to correlate clinical observation with operative and post-mortem findings. Larrey, for example, observed the effects of injury to various regions of the brain, and noted some facts of importance in cerebral localisation, such as loss of memory, aphasia, contralateral palsy, the homolateral paresis of cerebellar lesions, the respiratory failure of cerebellar lesions, and the connexion of cerebellar abscess with otitic disease. Petit's instruments are very similar to some that have been in common use in our own time. His trephine was cone-shaped, and had outside serrations. His "trépan exfoliatif" was very like the carpenter's bit of the present day. In the writings of Hunter there are accounts of operations by him upon the skull, the brain, and the meninges, and his records are good examples of his well-known carefulness in observation and in reporting. Trepanning, however, passed through many vicissitudes and its repute varied widely from time to time. For example, so recently as 1840 Pirrie said: "These fractures, and the numerous inventions of instruments for cutting the skull, are sad monuments of the Surgery of past ages." That the lay mind, however, even quite early, was not averse from seeing good in the operation, is attested by many examples, and there is the historic instance of Philip, Count of Nassau, who was thrown from his horse when riding and sustained a fracture of the skull. Having ultimately made a good recovery, he gave his surgeon the following testimonial: "I, the underwritten Philip, Count of Nassau, hereby declare and testify that Mr. Henry Chadborn did trepan me in the skull 27 times, and after that did cure me well and soundly." Astley Cooper (1768–1841), though he practised trephining in selected cases, seems to have discouraged it, except in compound fractures of the skull, though he mentions one case of cure of Jacksonian epilepsy by operation.

The rule of practice established by Pott was to the effect: "that, in every case of fracture of the skull, with depression, the skull should be perforated, and the depressed fragment of bone either raised to its proper level or entirely removed." This rule came to be set aside, it appears, mainly by reason of the authority of Abernethy who, about the year 1811 A.D., set forth as his opinion that trephining might often be dispensed with, even in fractures of the skull where depression of bone was definitely known to be present. In support of his view Abernethy related five cases of fracture of the skull with depression, which he had under his care in St. Bartholomew's Hospital within 12 months, and which terminated favourably though no operation was performed. Thereafter, according to Francis Adams, in "The Genuine Works of Hippocrates," "it became the established rule of practice in British surgery never to interfere in cases of

* Abstracted from a presidential address delivered to the Glasgow University Medico-Chirurgical Society.

fracture of the skull unless with the view of removing urgent symptoms." This reactionary teaching seems to have held the field for close on 30 years, and in accomplishing its overthrow, and bringing back surgical opinion to the teaching of Pott, Francis Adams ascribes a notable place to what he terms "the elaborate and trustworthy statistics, published in 1844 A.D., by Dr. Lawrie of Glasgow" (later Regius professor of surgery—the immediate predecessor of Lister). These statistics were compiled from the records of the Glasgow Infirmary. Lawrie's conclusion was as follows: "From what we have said, it will appear that we coincide with those who, in using the trephine, in cases of compound fracture of the skull, look more to the state of the bone than to the general symptoms, and who employ it more as a preventive of inflammation, and its consequences, than as a cure for urgent symptoms, the immediate result of the accident." This is surely a very unique and remarkable example of the value and effect of carefully compiled statistics and careful deduction therefrom.

THE "LOOK AROUND."

It has long been an accepted fact that travel is a valuable adjunct in any liberal system of education. No nation probably more than the Scots have recognised the educative value of travel. Even in mediæval times Scotsmen travelled far abroad, in France, Italy, and the low countries. Scots students were found at many continental colleges and universities, and not a few Scotsmen even held professorial chairs abroad. In addition to those who travelled thus for purely educative purposes, many spent time and fortune in the Spanish Wars and in the wars in the Low Countries, returning later on to play their several parts at home. Even in comparatively recent times, a period of travel abroad has been generally regarded as an important factor in the completion of a good general education, so that such a term as the "travel year" or "Wanderjahr" has found its way into accepted literature and even into classical dictionaries. If desirable as an adjunct to any liberal general education, it is all the more to be recommended as a valuable agent in the training of the surgeon.

The special benefits to be expected from properly directed travel are many. Other people, other methods of working, other points of view encountered in the course of travel must suggest to the receptive imagination new aspects of truth, which, after all, is many sided. It is well to realise that truth is not bound up in a closed packet, possessed by any one school of thought, but is the heritage of all, and it is bound to be appreciated in different ways by differing schools of thought. It follows that the practical applications of truth have many different possibilities, and it may be the lot, or the luck, of one school to perceive a direction of advance that is obscured to other schools. The surgeon who visits other schools, with an open mind, can hardly fail to pick up ideas that may fructify in many useful ways. In his own school, and working constantly among others of his school—competent though they be—the surgeon is apt to become wedded to stereotyped methods and locally accepted dogma. Let him travel, visit other schools, whether at home or abroad, and witness the work of others. He is set a-thinking, and his outlook is inevitably broadened. So must his technique and his practice profit by what he sees, whether or not he be led to adopt the new and to discard or modify the old.

There is little doubt that one of the most attractive features of a travel tour, whether at home or abroad, is the opportunity it affords of seeing some of the famous men whose names are known to us by their notable researches or writings. It will not always happen that contact with a man and his work will confirm a preconceived estimate based on the study of his writings, but even disillusionment is a definite gain, for one knows thenceforward what value to place upon further publications from the same source. It has, however, seldom been my experience to encounter such disillusionment. In nearly every case the man whom I have judged on the basis of his published works to be a great surgeon has proved to be greater than his writings, and it has been, in consequence, a satisfaction and an inspiration to see him at work in his own clinic or laboratory. Schools achieve fame, centres of learning acquire distinction, largely in virtue of the great names upon the rolls of their professoriate or teaching staff. It is almost always the man who counts, and the traditions of a school are built up on the records of work done by famous members of the staff, whose memory and whose standing are held in high honour by alumni and adherents. The great surgeon whom alone you desire to meet upon your travels will be a man compounded of all sorts of qualities, amongst which mere manual dexterity, and what might be called brilliancy in operating, may take but a secondary place. But no surgeon can be truly great unless his practice be humane, and unless he be as honest with himself as with his fellows, claiming for no procedure, for no operation—however brilliant or however personal to himself and to his reputation—one jot of credit more than its results indisputably warrant.

At what stage in his career should the surgeon fare forth to see the world? Should he set out immediately his Alma Mater has conferred on him his graduate degree? Or should his "Wanderjahr" come later on, when a further spell of post-graduate study has already added substantially to his groundwork of knowledge? This is a question that is not easy to answer. The decision will depend very much on the manner in which he proposes to plan his travel. If he intends to go to one or two places only, and to settle down there for a definite period of continuous study, under the guidance of a man who is an acknowledged authority in the special line of his projected study, then I see no reason for delay. But I doubt if, at this early period of his career, the young surgeon will profit much by a mere tour of travel in which he visits many different clinics, spending, it may be, but a day or two in each. The fresh graduate is unlikely yet to have the mental balance which would enable him to profit by such a haphazard collection of observations as he may thus acquire. For the mature man, well grounded in his science and well versed in its modern developments, who has already acquired for himself a substantial experience and who is now fitted to assess values, it is a very different thing. For him it will be, in the years that follow, a means of constant refreshment to visit other schools and clinics, and will serve him as a recurring corrective in his practice. To the immature man, the effect of such a tour may even be harmful, in that it may lead him to form erroneous opinions, based on insufficient data and wrongly assessed impressions. Let it not be supposed that travel as a means of surgical training must be necessarily or exclusively travel abroad. Much may be gained by visits to schools and clinics in our own country, and I have often thought that it would be a good thing if we had some regular and regularised interchange of students and of teachers between the various schools at home.

From his travel tour the surgeon will return, I hope, with much valuable information, and many new ideas, to help him in his further development. But I am confident that you, if you travel, will have the same experience as I have had; the same feeling of deep satisfaction that has been mine in coming again amongst our own people. With each recurring visit I pay to other clinics I come back to my own with a deep sense of satisfaction. There *are* things—and they are not few—which we do better here than elsewhere; there *are* many aspects and departments of surgery which are certainly as far advanced, as well developed, here as in other schools. We are heirs to great traditions; let us see that these great traditions remain unsullied.

PUBLIC HEALTH IN NORTHERN RHODESIA.

THE territory known as the Protectorate of Northern Rhodesia lies between longitudes 22° E. 35′ E., and between latitudes 8° 15′ S. and 18° S. It is bounded on the west by Angola, on the north-west by the Belgian Congo, on the north-east by Tanganyika Territory, on the east by the Nyasaland Protectorate and Portuguese East Africa, and on the south by Southern Rhodesia and the mandated territory of South-West Africa—comprising in all an area that is computed to be about 278,950 square miles. The River Zambesi forms the greater part of the southern boundary; its two main northern tributaries are the rivers Kafue and Luangwa. With the exception of these river valleys, the territory consists of a table-land varying from 3000 to 4000 feet in height, though in the north-eastern portion, and especially in the vicinity of Lake Tanganyika the altitude is greater. At the present time statistics are available of 70 different tribes resident in the Territory, and there are said to be 38 distinct native languages in use. Previous to 1889 the whole territory had been vaguely included in the Charter granted to the British South Africa Company, but in that year the Barotseland (North-Western Rhodesia) Order in Council placed the administration of the western portion of the country by the company on a firm basis; and this was closely followed by the North-Eastern Rhodesia Order in Council of 1900 with similar effect. The two territories were amalgamated in 1911 under the designation of Northern Rhodesia, and the administration of the company continued until 1924, when, in terms of a settlement arrived at between the Crown and the Company, the administration of the Territory was assumed by the Crown, and the first Governor (Sir H. J. Stanley) was appointed on April 1st of the same year. He was succeeded in August, 1927, by Sir J. Crawford Maxwell.

Climate.

There are considerable climatic differences between various parts of the country. The Zambesi, the Luangwa, and the Kafue valleys experience a much greater humidity and a more trying heat than do the plateaux above 3500

or 4000 ft. The hottest months are October and November, before the rains break, when the mean maximum is about 97° F. in the Zambesi valley stations and 85° at plateau stations. The mean maximum for the eight months of the hot season (September to April) is approximately 90·3° with a mean minimum of 64·5° while the corresponding figures for the four months of the cold season (May to August) are 78·7° and 46·6°. The highest temperature recorded in the Territory was 116° at the Barotse National School in October, and the lowest was 22° at Sesheke in July.

The rainy season usually commences in November and lasts until April, after which month rain is only rarely experienced, and then in negligible quantities. The rainfall recorded at Livingstone was 19·17 in., at Broken Hill 31·42 in., at Fort Jameston 41·82 in., and at Abercorn 44·17 in. In the western districts 55·51 in. were recorded at Mwinilurga and 46·36 in. at Mongu. Minor earth tremors were felt at various places in the Territory.

Vital Statistics.

In the latest official report on the affairs of the Protectorate, prepared by Mr. G. A. S. Northcote, Chief Secretary, the native population is estimated at 1,237,486. There is, it is stated, no system of birth or death registration possible at present and consequently no figures are available from which vital statistics may be obtained. Infantile mortality is known to be high and has been estimated to be between 40 per cent. and 50 per cent. of children born. The European population in 1927 was 7275, and their general health was good. The death-rate per 1000 was returned at 9·89 (as against 11·1 in 1926, and 13·7 in 1927). 144 children were born, which represents a crude birth-rate of 20 per 1000 as compared with 25·4 per 1000 in 1926.

Hospitals.

The Government maintains European hospitals at Livingstone, Lusaka, Broken Hill, Fort Jameson, and Kasama. Native hospitals are maintained at these places, and also at Mazabuka, Solwezi, Ndola, and Fort Rosebery. In addition, many mission doctors, hospitals, and dispensaries receive annual subsidies from the Government for medical work in native areas. During the year, 923 Europeans and 7288 natives were admitted to hospital and there were 27 and 418 deaths respectively among them. No complete records as to the number of patients treated at out-stations are available for either the European or the native population, though it is estimated that the latter are about 5000, many of whom were treated for trivial complaints.

Infectious Diseases.

One European and 22 native cases of *sleeping sickness* came under treatment, eight of the latter proving fatal. The only epidemic manifestation of the disease was on the Mwangazi River in the Fort Jameson sub-district. Isolated cases of what is presumed to be sleeping sickness have been reported from various parts of the Luangwa Valley, but the disease is not now prevalent there.

The following table gives the number of persons admitted to hospital suffering from *malaria* and *blackwater fever* with mortality statistics in each case, figures being also given for 1925 and 1926 :—

Year.	European population.	Malaria.		Blackwater fever.	
		Cases.	Deaths.	Cases.	Deaths.
1927 ..	7275 ..	272	6 ..	20	5
1926 ..	5581 ..	262	1 ..	21	7
1925 ..	4624 ..	211	6 ..	13	7

Influenza has been present over the whole Territory, but the incidence shows a decrease on previous years. The results of the treatment of yaws with bismuth and sodium tartrate continue to be satisfactory; this disease is chiefly prevalent in the Kasempa, Kafue, and Luapula areas.

Native Department statistics show that there are 5218 *lepers* in the Territory, of whom 3816 have been notified to the medical officers. No statistics are available for mortality. A system of voluntary segregation in coöperation with the various missionary societies will shortly be commenced and gradually developed in combination with the establishment of treatment centres for early cases.

Outbreaks of *small-pox*, *chicken-pox*, and *Kaffir-pox* occurred in many parts of the Territory, but were for the most part localised. The mortality-rate was low. 177,290 persons were vaccinated, and, as far as can be ascertained, the results were successful in about 80 per cent. of cases.

Ankylostomiasis is widely distributed amongst the native population. It is impossible to state with any accuracy to what extent bilharziasis is present. Hospital statistics show an infection-rate of about 0·5 per cent. of those examined. It is hoped that in time circumstances will permit of a more comprehensive survey of this and other diseases, and will facilitate the institution of intensive treatment.

(*Continued at foot of next column.*)

THE KING'S ILLNESS.

OFFICIAL BULLETINS.

(*Continued from p. 166.*)

THE following is the text of the official bulletins which have been issued during the past week and signed by Sir Stanley Hewett and Lord Dawson of Penn :—

THURSDAY, JAN. 17TH. 11.30 A.M.

The King has had a good night and progress, though slow, is satisfactory. The next bulletin will be issued on Friday evening. (Signed also by Sir Hugh Rigby.)

FRIDAY, JAN. 18TH. 8.15 P.M.

The King has had a quiet day. There is no change to report in His Majesty's condition. The next bulletin will be issued to-morrow night.

SATURDAY, JAN. 19TH. 8.30 P.M.

The King continues to make slow progress. The amount of nourishment taken in now satisfactory and the general strength is improving.

TUESDAY, JAN. 22ND. 12 NOON.

The King has had a quiet night. The temperature has now remained normal for many days, and the condition of the pulse satisfactory. The empyema wound is small and steadily healing. With a returning appetite the amount of nourishment is adequate and includes solid food. Although the general strength shows improvement, there is not as yet any appreciable increase in weight. We feel the time is approaching when His Majesty's removal to sea air will be advantageous. (Signed also by Sir Hugh Rigby, Sir Farquhar Buzzard, and Sir Humphry Rolleston.)

(*Continued from previous column.*)

There is no indication of the distribution or extent of *tuberculosis*. That the degree of infection is low is indicated by native hospital and out-patient returns and by the medical examination of large numbers of natives for various purposes.

The continued activity in mining operations in the Territory has provided Northern Rhodesia natives with a labour market comparatively close to their homes, and, generally speaking, the response has been very satisfactory. Northern Rhodesia mines offer wages and conditions of housing, feeding, and general attention which compare favourably with the extra territorial labour centres which compete for the Territory's labour.

"OUR TOUNIS COLLEGE."

AN anthology[1] of verse, compiled from the pages of the *Student* by David B. Keir and Walter P. Kennedy, has been issued by the Students' Representative Council of the University of Edinburgh as part of a considered effort to foster the interest in the history and tradition of the University which has become apparent in the post-war renaissance. It consists of over 300 poems which have appeared in the *Student* during the last 40 years, with a few more from other, and earlier, sources. It contains fare to suit all tastes—the gay, the grave; the plaintive and the boisterous; love songs and drinking songs; and excellent fooling; all are here. For the most part the verses reach a high level and possess intrinsic merits which raise them much above the standard of the ordinary college magazine. And although we are told that the volume has been primarily prepared for students and alumni of Edinburgh, we believe it will appeal to a wider public.

PLASMOCHIN IN MALARIA AND BLACKWATER FEVER: A CORRECTION.

IN summarising last week (p. 166) the important work of Dr. Drenowsky on the treatment of malaria by plasmochin in a Bulgarian country practice, the safe dose of this drug was stated not to exceed 0·01 g. per kg. of body-weight. This should have read 0·01 g. per 10 kg. of body-weight, which works out at about gr. 1 (not grs. 10) for a 10-stone man. As the larger dose may easily produce serious results we desire to call immediate attention to the correction.

[1] Our Tounis College. Edinburgh: The Darien Press. 1928. Pp. 412. 3*s.* 6*d.*